
opticalmaterialspy Documentation

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Contents:

INTRODUCTION

This documentation supports *opticalmaterials.py*, a library useful for storing and calculating common optical material parameters.

EXAMPLES

An example script.

2.1 Example 1

```
import opticalmaterialspy as mat

m = mat.SiO2()

# Refractive index @ 1550nm.
print('n(1.55e-6m):', m.n(1.55e-6)) # Knows 1.55e-6 must be [m].
print('n(1.55um):', m.n(1.55)) # Knows 1.55 must be [um].
print('n(1550nm):', m.n(1550)) # Knows 1550 must be [nm].

# Group velocity refractive index @ 900nm.
print('n_gv(900nm):', m.ng(900))

# Group velocity dispersion @ 808nm.
print('GVD(0.808um):', m.gvd(0.808))
```


API DOCUMENTATION

3.1 Materials

3.1.1 Classes

<i>Air</i> ()	
<i>Al2O3</i> (axis)	
<i>Bbo</i> (axis)	
<i>Bibo</i> (axis)	
<i>Chalcogenide</i> (chalcogenideType)	
<i>Data</i> (wls, ns)	An object that facilitates importing materials from lists.
<i>Ktp</i> (axis)	
<i>Ln</i> (axis[, temperatureCelcius])	
<i>LnMg</i> (axis)	
<i>LnMgTemp</i> (axis[, temperatureCelcius])	
<i>RefractiveIndexWeb</i> (web_link)	Object to create a <i>_Material</i> based on data from https://refractiveindex.info/ .
<i>RefractiveIndexWebCSVLink</i> (csv_link)	Object to create a <i>_Material</i> based on data from https://refractiveindex.info/ .
<i>SiO2</i> ()	
<i>Su8</i> ()	
<i>Tfln</i> (axis[, temperatureCelcius])	
<i>TiO2</i> (axis)	

Air

class Air

Bases: `_Material`

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

`beta0(wavelength)`

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

`beta1(wavelength)`

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Al2O3

class Al203(*axis*)

Bases: `_Material`

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Bbo

class `Bbo`(*axis*)

Bases: `_Material`

Methods Summary

<code>beta0</code> (wavelength)	The propagation constant of the material.
<code>beta1</code> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<code>beta2</code> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps</code> ([wavelength])	The permittivity of the desired material.
<code>gvd</code> (wavelength)	The group velocity dispersion (GVD) of the material.
<code>n</code> ([wavelength])	The refractive index of the desired material.
<code>nDer1</code> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<code>nDer2</code> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<code>ng</code> (wavelength)	The group index of the material.
<code>vg</code> (wavelength)	The group velocity of the material.
<code>z0</code> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Bibo

class Bibo(*axis*)

Bases: *Bbo*

Methods Summary

<i>beta0</i> (wavelength)	The propagation constant of the material.
<i>beta1</i> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<i>beta2</i> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<i>convertWavelengthUnitsNm</i> ()	
<i>eps</i> ([wavelength])	The permittivity of the desired material.
<i>gvd</i> (wavelength)	The group velocity dispersion (GVD) of the material.
<i>n</i> ([wavelength])	The refractive index of the desired material.
<i>nDer1</i> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<i>nDer2</i> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<i>ng</i> (wavelength)	The group index of the material.
<i>vg</i> (wavelength)	The group velocity of the material.
<i>z0</i> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Chalcogenide

class `Chalcogenide`(*chalcogenideType*)

Bases: `_Material`

Methods Summary

<code>beta0</code> (wavelength)	The propagation constant of the material.
<code>beta1</code> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<code>beta2</code> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm</code> ()	
<code>eps</code> ([wavelength])	The permittivity of the desired material.
<code>gvd</code> (wavelength)	The group velocity dispersion (GVD) of the material.
<code>n</code> ([wavelength])	The refractive index of the desired material.
<code>nDer1</code> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<code>nDer2</code> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<code>ng</code> (wavelength)	The group index of the material.
<code>vg</code> (wavelength)	The group velocity of the material.
<code>z0</code> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Data

class Data(*wls*, *ns*)

Bases: `_Material`

An object that facilitates importing materials from lists.

Parameters

- **wls** (*list*) – List of wavelengths.
- **ns** (*list*) – List of refractive indices at the corresponding *wls*. Should be the same size as *wls*.

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type
float, list

Ktp

class Ktp(*axis*)

Bases: `_Material`

Methods Summary

<code>beta0</code> (wavelength)	The propagation constant of the material.
<code>beta1</code> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<code>beta2</code> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm</code> ()	
<code>eps</code> ([wavelength])	The permittivity of the desired material.
<code>gvd</code> (wavelength)	The group velocity dispersion (GVD) of the material.
<code>n</code> ([wavelength])	The refractive index of the desired material.
<code>nDer1</code> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<code>nDer2</code> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<code>ng</code> (wavelength)	The group index of the material.
<code>vg</code> (wavelength)	The group velocity of the material.
<code>z0</code> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Ln

class Ln(*axis*, *temperatureCelsius*=20.0)

Bases: `_Material`

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

LnMg

class `LnMg`(*axis*)

Bases: `_Material`

Methods Summary

<code>beta0</code> (wavelength)	The propagation constant of the material.
<code>beta1</code> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<code>beta2</code> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps</code> ([wavelength])	The permittivity of the desired material.
<code>gvd</code> (wavelength)	The group velocity dispersion (GVD) of the material.
<code>n</code> ([wavelength])	The refractive index of the desired material.
<code>nDer1</code> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<code>nDer2</code> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<code>ng</code> (wavelength)	The group index of the material.
<code>vg</code> (wavelength)	The group velocity of the material.
<code>z0</code> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

LnMgTemp

class LnMgTemp(*axis*, *temperatureCelcius=20.0*)

Bases: `_Material`

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

RefractiveIndexWeb

class `RefractiveIndexWeb(web_link)`

Bases: `Data`

Object to create a `_Material` based on data from <https://refractiveindex.info/>.

Parameters

web_link (`str`) – The web link to the material. As an example, for GaAs by Aspnes et al. 1986 the one should use ‘<https://refractiveindex.info/?shelf=main&book=GaAs&page=Aspnes>’.

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(wavelength)

The propagation constant of the material.

Parameters

wavelength (`float`, `list`, `None`) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

`float`, `list`

beta1(wavelength)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (`float`, `list`, `None`) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

RefractiveIndexWebCSVLink

class `RefractiveIndexWebCSVLink(csv_link)`

Bases: `Data`

Object to create a `_Material` based on data from <https://refractiveindex.info/>.

Parameters

web_link (`str`) – The web link to the material. As an example, for GaAs by Aspnes et al. 1986 the one should use ‘<https://refractiveindex.info/?shelf=main&book=GaAs&page=Aspnes>’.

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(wavelength)

The propagation constant of the material.

Parameters

wavelength (`float`, `list`, `None`) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(wavelength)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (`float`, `list`, `None`) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()

eps(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

SiO2

class SiO2

Bases: `_Material`

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Su8

class Su8

Bases: `_Material`

Methods Summary

<code>beta0(wavelength)</code>	The propagation constant of the material.
<code>beta1(wavelength)</code>	The derivative of the propagation constant with respect to angular frequency.
<code>beta2(wavelength)</code>	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps([wavelength])</code>	The permittivity of the desired material.
<code>gvd(wavelength)</code>	The group velocity dispersion (GVD) of the material.
<code>n([wavelength])</code>	The refractive index of the desired material.
<code>nDer1(wavelength)</code>	The first derivative of the refractive index with respect to wavelength.
<code>nDer2(wavelength)</code>	The second derivative of the refractive index with respect to wavelength.
<code>ng(wavelength)</code>	The group index of the material.
<code>vg(wavelength)</code>	The group velocity of the material.
<code>z0(wavelength)</code>	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

`beta0(wavelength)`

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

`beta1(wavelength)`

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

Tfln

class **Tfln**(*axis*, *temperatureCelcius*=20.0)

Bases: *Ln*

Methods Summary

<i>beta0</i> (wavelength)	The propagation constant of the material.
<i>beta1</i> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<i>beta2</i> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<i>convertWavelengthUnitsNm</i> ()	
<i>eps</i> ([wavelength])	The permittivity of the desired material.
<i>gvd</i> (wavelength)	The group velocity dispersion (GVD) of the material.
<i>n</i> ([wavelength])	The refractive index of the desired material.
<i>nDer1</i> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<i>nDer2</i> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<i>ng</i> (wavelength)	The group index of the material.
<i>vg</i> (wavelength)	The group velocity of the material.
<i>z0</i> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float, list, None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The impedance of the material.

Return type

float, list

TiO2

class `TiO2`(*axis*)

Bases: `_Material`

Methods Summary

<code>beta0</code> (wavelength)	The propagation constant of the material.
<code>beta1</code> (wavelength)	The derivative of the propagation constant with respect to angular frequency.
<code>beta2</code> (wavelength)	The second derivative of the propagation constant with respect to angular frequency.
<code>convertWavelengthUnitsNm()</code>	
<code>eps</code> ([wavelength])	The permittivity of the desired material.
<code>gvd</code> (wavelength)	The group velocity dispersion (GVD) of the material.
<code>n</code> ([wavelength])	The refractive index of the desired material.
<code>nDer1</code> (wavelength)	The first derivative of the refractive index with respect to wavelength.
<code>nDer2</code> (wavelength)	The second derivative of the refractive index with respect to wavelength.
<code>ng</code> (wavelength)	The group index of the material.
<code>vg</code> (wavelength)	The group velocity of the material.
<code>z0</code> (wavelength)	The wave impedance assuming the material is dielectric (not lossy or magnetic).

Methods Documentation

beta0(*wavelength*)

The propagation constant of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta1(*wavelength*)

The derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

beta2(*wavelength*)

The second derivative of the propagation constant with respect to angular frequency.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the propagation constant will be evaluated at.

Returns

The propagation constant at the target wavelength(s).

Return type

float, list

convertWavelengthUnitsNm()**eps**(*wavelength=None*)

The permittivity of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the permittivity will be evaluated at.

Returns

The permittivity at the target wavelength.

Return type

float, list

gvd(*wavelength*)

The group velocity dispersion (GVD) of the material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the GVD will be evaluated at.

Returns

The GVD at the target wavelength(s).

Return type

float, list

n(*wavelength=None*)

The refractive index of the desired material.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength the refractive index will be evaluated at.

Returns

The refractive index at the target wavelength.

Return type

float, list

nDer1(*wavelength*)

The first derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float*, *list*, *None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

nDer2(*wavelength*)

The second derivative of the refractive index with respect to wavelength.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the derivative will be evaluated at.

Returns

The refractive index at the target wavelength(s).

Return type

float, list

ng(*wavelength*)

The group index of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group index will be evaluated at.

Returns

The group index at the target wavelength(s).

Return type

float, list

vg(*wavelength*)

The group velocity of the material.

Parameters

wavelength (*float, list, None*) – The wavelength(s) the group velocities will be evaluated at.

Returns

The group velocities at the target wavelength(s).

Return type

float, list

z0(*wavelength*)

The wave impedance assuming the material is dielectric (not lossy or magnetic).

Parameters

wavelength (*float, list, None*) – The wavelength(s) the propagation constant will be evaluated at.

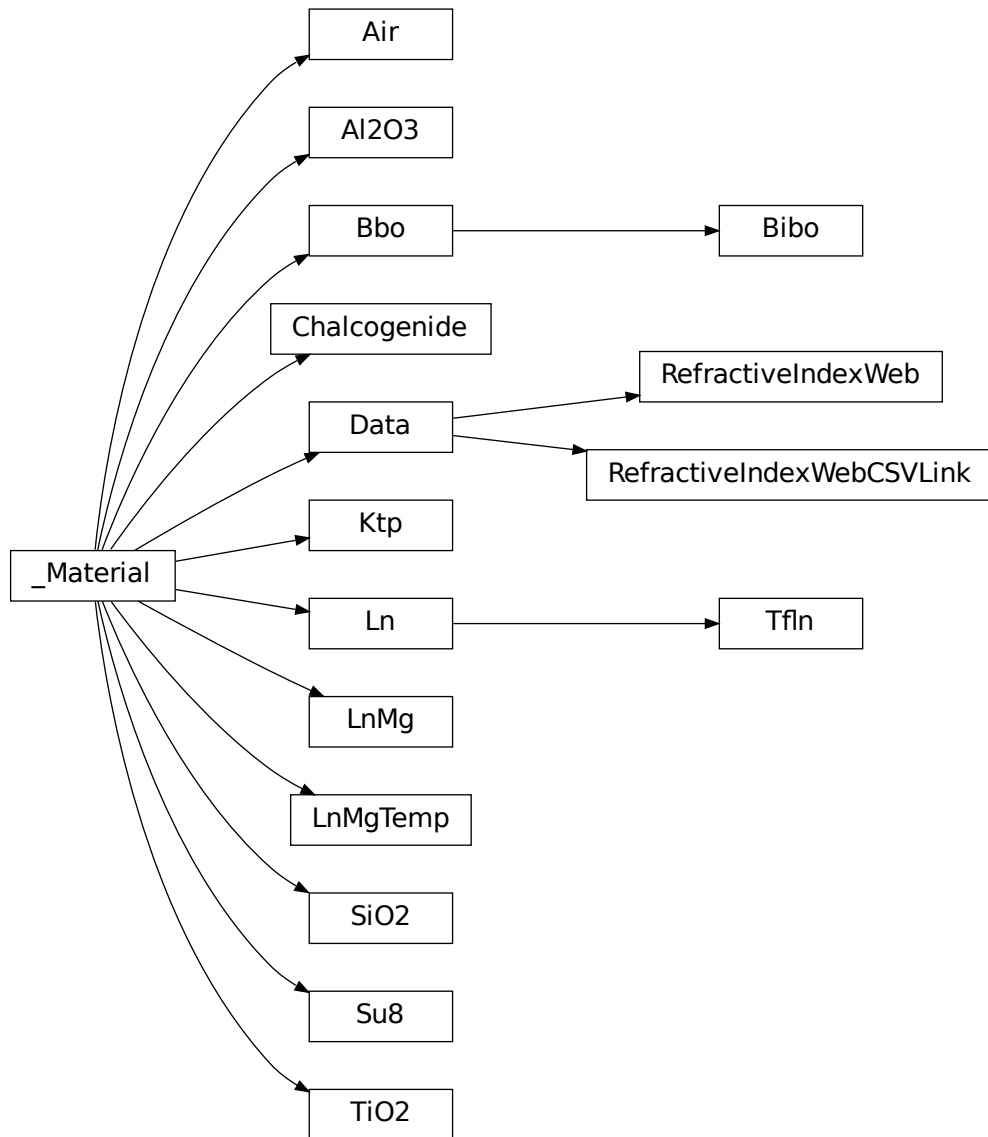
Returns

The impedance of the material.

Return type

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3.1.2 Class Inheritance Diagram



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