Mode Solver

Informative session

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Overview

Table of Contents

Salient features

The Mode solver performs optical mode calculations on the 2D device structure *or* 2D/1D cross-section of 3D/2D device structures. These structures are assumed to be the cross-sections of waveguides.

Salient features –

- Materials with constant / wavelength dependent real and complex permittivity.
- *Scalar* or *vectorial* mode-equation can be selected.
- Any of the *power method* or *ARPAK routines* can be used for mode calculation.
- Calculates multiple modes near the given *effective index*.
- Stores normalized electric and magnetic field vectors in hdf file + creates an *xdmf* file for visualization in *paraview*.
- Supports reflective BC at the boundaries

Table of Contents

Easy-to-use Config file

```
File: {
   Device = "modeSiWG_str.cfg";
   Out = "SiWG";
}

Solver: {
   Polarization = "TM"; // applicable for scalar equations only
   Equation = "Vectorial";
   Wavelength = 1.; // in Micrometer
   EffectiveIndex = 3.07;
   DecayConstant = 0.;
   CoordinateCut = 0.0; // in Micrometer
   MaximumModes = 1;
   SolverSettings = [
    "UsePowerMethod",
    "WavelengthDepIndex",
//"YCutDevice"
    ];
   PowerMethodTol = 1E-8;
   PowerMethodMaxIter = 40;
}
```

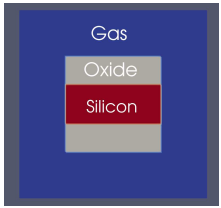
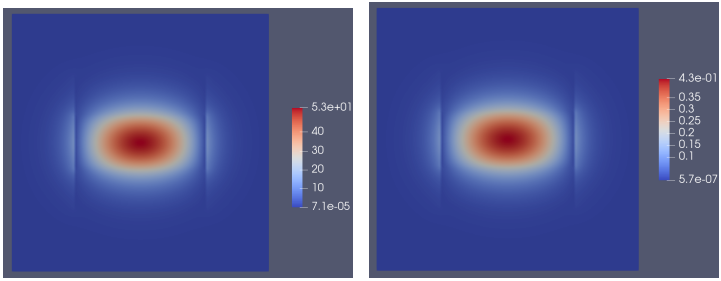


Figure: Structure of the cross-section of a waveguide

- Include a new device structure.
- Define various solver settings, such as-
  - `Scalar` or `Vectorial`
  - Polarization (`TM` or `TE`).
  - Target effective index
- Specify if mode of the *entire device* or *a cross-section* is calculated.

Results Visualization



(a) E_y (b) H_z

Figure: E_y and H_z of the calculated mode normalized such that the modal power is unity.

- `Quantities` to be saved.
- Saves an *xdmf* script for visualization in *paraview*.

Table of Contents

Easy-to-install licenses

For ordering a license, along with the name and the organization details, please also provide –

- For the node-locked licenses: Ethernet mac address of the client machine on which the software will run.
  OR
- For the server licenses: Ethernet mac address of the server machine at the client organization.

If you purchased one or more node-locked licenses, you will receive the following license file by secured email.

1. NodeLocked License_<id>_<Info>.lic, where <id> stands for license id and <Info> stands for customer identification in short.

Copy the license file to `/var/local/oesoft/licenses/` on the machine whose mac-address has been provided and change its access rights to `777`.

If you purchased one or more server licenses, you will receive the following license file by secured email.

1. Server License_<id>_<Info>.lic

Copy the license file to `/usr/share/oesoft/licenses/` on the *server machine* whose mac-address has been provided.

The End

Questions? Comments?