The nanobem toolbox and T-matrices

nanobem is a toolbox for the solution of Maxwell's equations for metallic and dielectric nanoparticles using a Galerkin boundary element method (BEM) approach. Details of the computational approach are described in:

- Hohenester, Nano and Quantum Optics (Springer 2020).
- Hohenester, Reichelt, Unger, CPC 276, 108337 (2022); CPC 294, 108949 (2024).

When using the toolbox we ask you to cite one of the CPC papers. In the following we briefly describe how to set up the toolbox and how to compute and store T-matrices.

Setting up the toolbox and the help pages

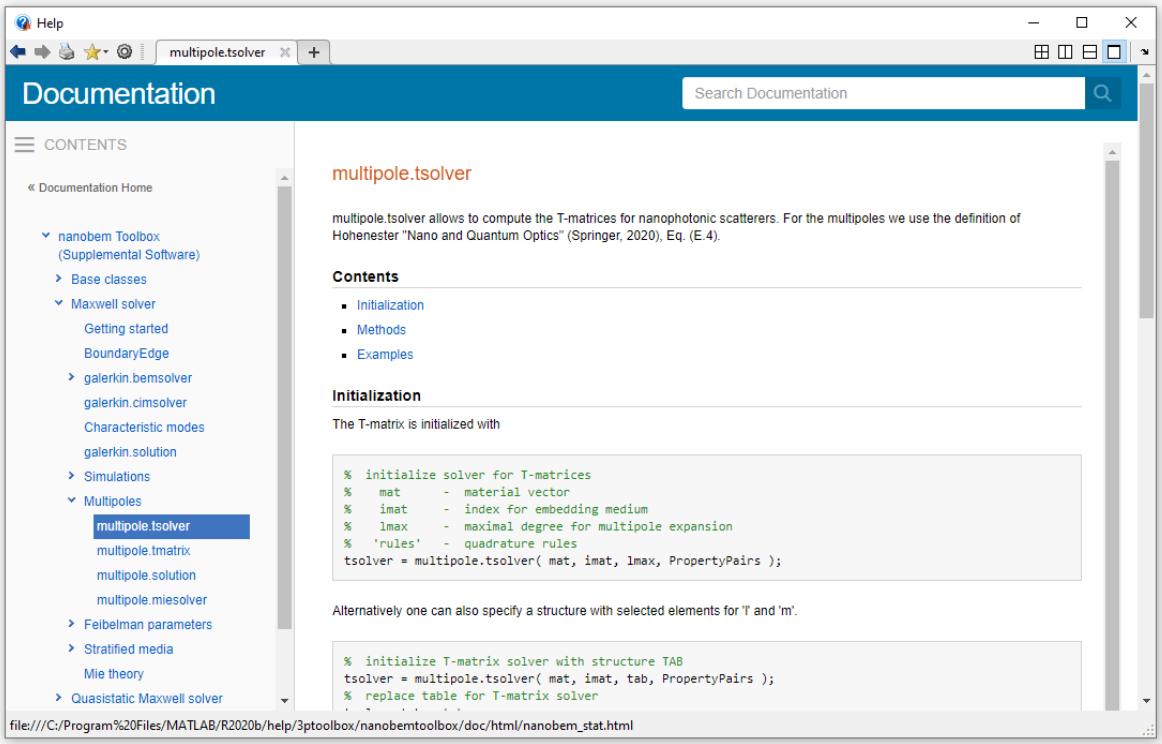
To install the toolbox, one must add the path of the main directory nanobemdir of the nanobem toolbox as well as the paths of all subdirectories to the Matlab search path. This can be done, for instance, through

```
>> addpath(genpath(nanobemdir))
```

To set up the help pages, one must once change to the main directory of the nanobem toolbox and run makehelp

```
>> cd nanobemdir
>> makehelp
```

Once this is done, the help pages, which provide detailed information about the toolbox, are available in the Matlab help browser in Documentation > Supplemental Software > nanobem.



Computation of T-matrices

The help pages contain under nanobem > Maxwell Solver > Multipole a detailed description of how to set up a T-matrix solver and how to compute and store T-matrices in a format that is compatible with treams and the T-matrix database. We also provide two demo files for a dielectric nanosphere and a TiO2 nanodisk.

- demomulti01.m - T-matrix for dielectric nanosphere and single wavelength.
- demomulti02.m - T-matrices for TiO2 nanodisk and multiple wavelengths.

Problems

In case of problems when installing the toolbox or running the programs please send a detailed report, ideally in combination with the Matlab files, to ulrich.hohenester@uni-graz.at.