A Thin Film Multilayer Toolbox for Octave and MATLAB

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New releases, additional documentation, and example scripts
can be downloaded from:
https://sites.google.com/site/ulfgri/numerical/tftb

Motivation

Functional surfaces consisting of multiple thin layers of different materials are used in numerous applications to modify the surface properties. Multilayers are very important in optics where they are used to modify the response of a surface to light. An example are anti-reflection coatings, which attenuate the reflection of light at an air-glass interface. In optics the spectral response of multilayer coatings is often of the greatest interest. Another area in which multilayers are important is photo-lithography. In photo-lithography a substrate is coated with a stack of resist materials. The quality of a lithographic exposure strongly depends on the optical properties of the resist stack and on its careful optimization. The spectral dependence of the film stack properties are less important in photo-lithography, because the wavelength is nearly monochromatic. Optimization of the layer thicknesses is usually more important.

Other Free Software

OpenFilters: http://larfis.polymtl.ca/index.php/en/links/openfilters

A thin film modeling program from the Functional Coating and Surface Engeineering Laboratory a the Ecole Polytecnique de Montreal, Quebec, Canada. Written in Python and C++ by "thin film professionals". Unfortunately, very limited database of refractive indices.

FreeSnell : http://people.csail.mit.edu/jaffer/FreeSnell/

FreeSnell is a software package for analyzing thin film multi-layers multi-layers written in Scheme. No design functionality.

tmm: https://pypi.python.org/pypi/tmm

TMM is a group of programs written in Python / NumPy for simulating light propagation in planar multilayer thin films, including the effects of multiple internal reflections and interference, using the "Transfer Matrix Method".

Units

The thin film toolbox uses the micrometer as length unit for thicknesses and wavelengths throughout.

Installation
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Unzip the file tftb-<n>.zip into a directory and include the 'tftb'
directory and its subdirectories in the Octave or MATLAB search path.
The refractive index spectra collections in file
'nk_collections_<date>.zip' must also be installed before the toolbox
can be used.

Please report inconsistencies, problems, and errors. Requests for
improvements are welcome !
