Guide of the Software

VCRMEll2D

Developed by

K. F. Ren

CNRS UMR 6614 - CORIA
Université de Rouen
Site Universitaire du Madrillet - BP 12
76801 Saint Etienne du Rouvray cedex
Tél. 33 (0)2 32 95 37 43 - Fax 33 (0)2 32 91 04 85
Email : fang.ren@coria.fr
www.coria.fr

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This software is based on the VCRM – Vectorial Complex Ray Model developed for the scattering of electromagnetic wave by an object of any shape with smooth surface. Please cite the two papers:

[1]. K. F. Ren, F. Onofri, C. Rozé and T. Girasole, "Vectorial complex ray model and application to two-dimensional scattering of plane wave by a spheroidal particle", Opt. Lett. 36(3): 370-372, 2011

[2]. K. F. Ren, C. Rozé and T. Girasole, "Scattering and transversal divergence of an ellipsoidal particle by using Vectorial Complex Ray Model", J. Quant. Spectrosc. Radiat. Transfer 113:2419–2423, 2012

This version consists of two models: the ray tracing and the calculation of the scattering diagram of an ellipsoid transparent or absorbing particle illuminated by a plane wave with arbitrary incident angle.

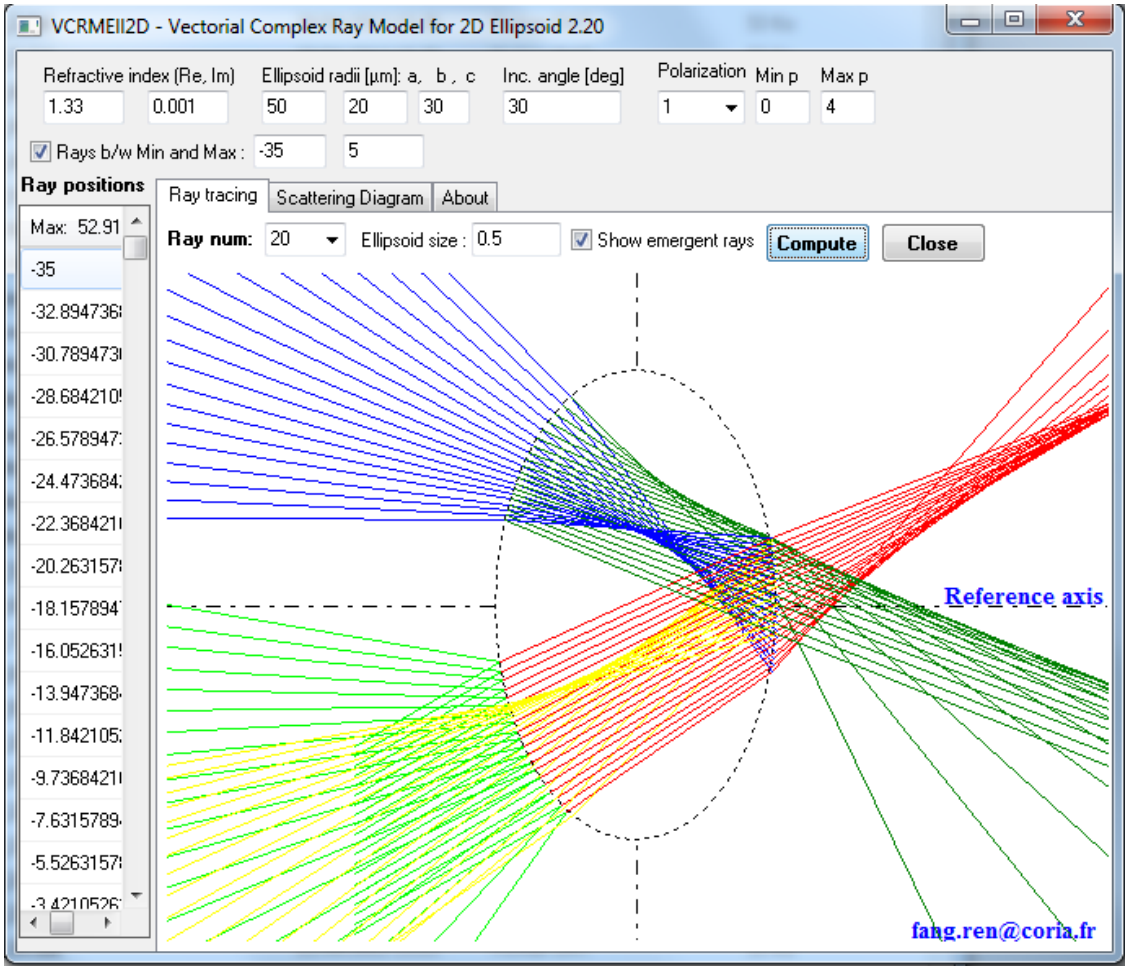
The ray tracing graphics is exported automatically in eps format (file name: VCRMEll2D.eps). The intensity of each order is stored separately in files VCRMEll2D_x.dat where x indicates the order of the ray or diffraction, and the total intensity is stored in VCRMEll2D_t.dat.

Parameters:

- Refractive index can be greater or less than 1, but this version is still limited to real value.
- Ellipsoid radii: (*a*, *b*, *c*) correspond to the radii in (*x*, *y*, *z*) directions where *x* is in the vertical direction, *y* perpendicular to the screen and *z* horizontal from left to right.
- Inc. angle in degree is relative to *z* axis.
- Polarization: 1 for the perpendicular and 0 for parallel.
- Min and Max order of rays are limited from 0 (reflection) to 20.
- Ellipsoid size permits to modify the size of the ellipse on the screen in order to see more or less detail of the rays in the particle.
- If Raysb/w Min and Max is checked, then only the incident rays between this will be traced and these values correspond to the intercept position of the incident ray with *y* axis.
- Number of rays is the number of rays for tracing.
- Ray positions just indicate the incident ray positions when Raysb/w Min and Max is not checked.

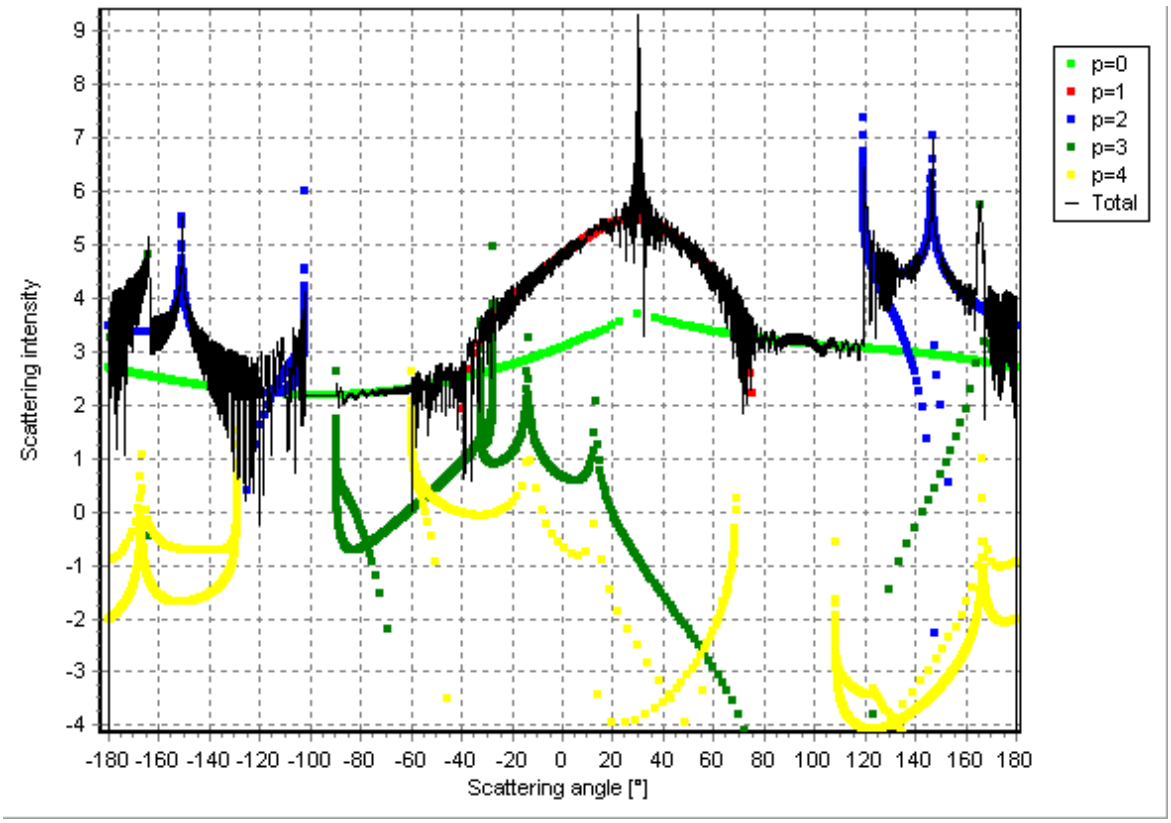
Ray tracing:

This module is to visualize the traces of the reflected and refracted rays for given range of orders.



Scattering diagram:

This module calculates the intensity of each individual order and the total scattered intensity with or without diffraction. The interference between different orders and the diffracted wave is taken into account.



About:

Information about the software: