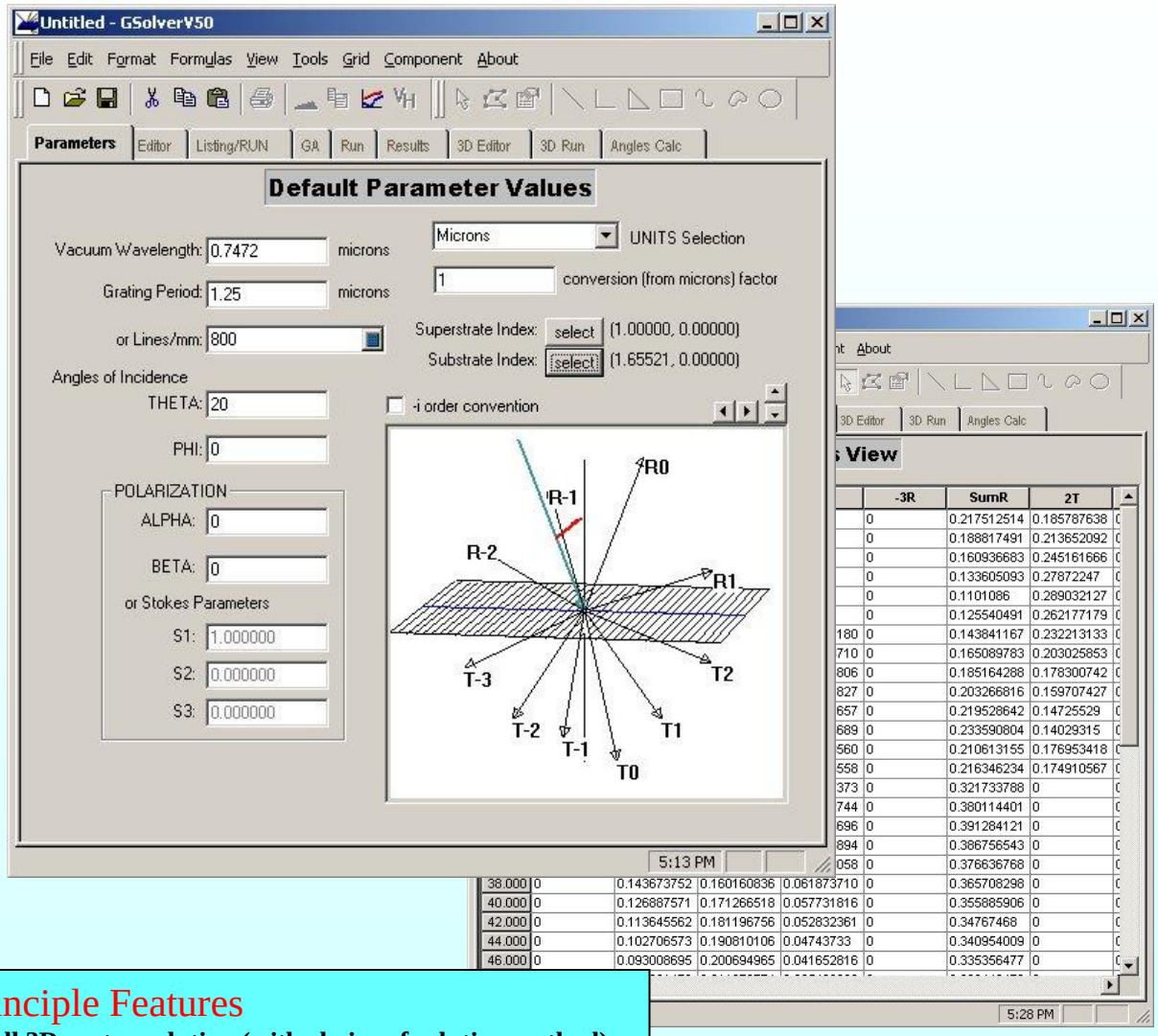
GSOLVER© V5.2 Diffraction Grating Analysis Program



Principle Features

- **Full 3D vector solution (with choice of solution method)**
- **Arbitrary polarization including TE, TM, Elliptical**
- **Conical mounts**
- **Arbitrary number of index changes per level**
- **Arbitrary number of grating levels**
- **Calculation of complex vector E-fields**
- **Powerful graphical grating structure editor**
- **Material catalogs and editor**
- **Optimized partitioned matrix calculations**
- **Multiple graphical, data spreadsheet, and text windows**
- **Genetic algorithm based automatic design**
- **Arbitrary algebraic constraints**
- **Diffraction angles calculation tool**
- **Diffracted order phase calculation**
- **128 and 256 bit floating point arithmetic**

Grating Solver Development Company

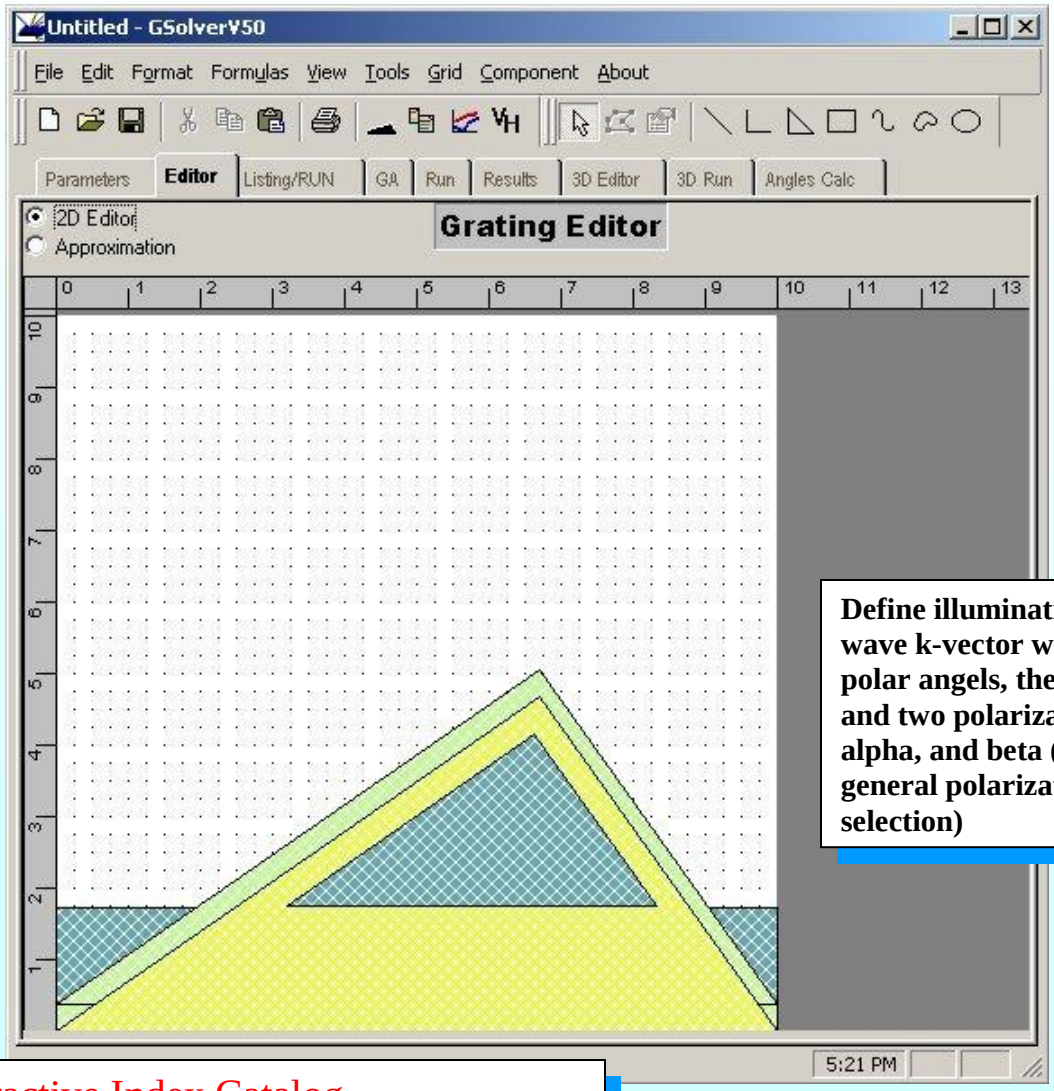
P.O. Box 353 - Allen, TX 75013
USA
(972)727-8008 (Voice/FAX)
http://www.gsolver.com

GSOLVER© V5.2 Graphical Grating Editor

Draw arbitrary profiles

- **Tools for classical profiles**
- **Draw structure on unit cell**
- **Pallet of graphical primitives**
- **Assign material properties**

- **Automatic piecewise constant approximation**
- **Drag and Drop graphical primitives**
- **OLE container for Microsoft Office products**



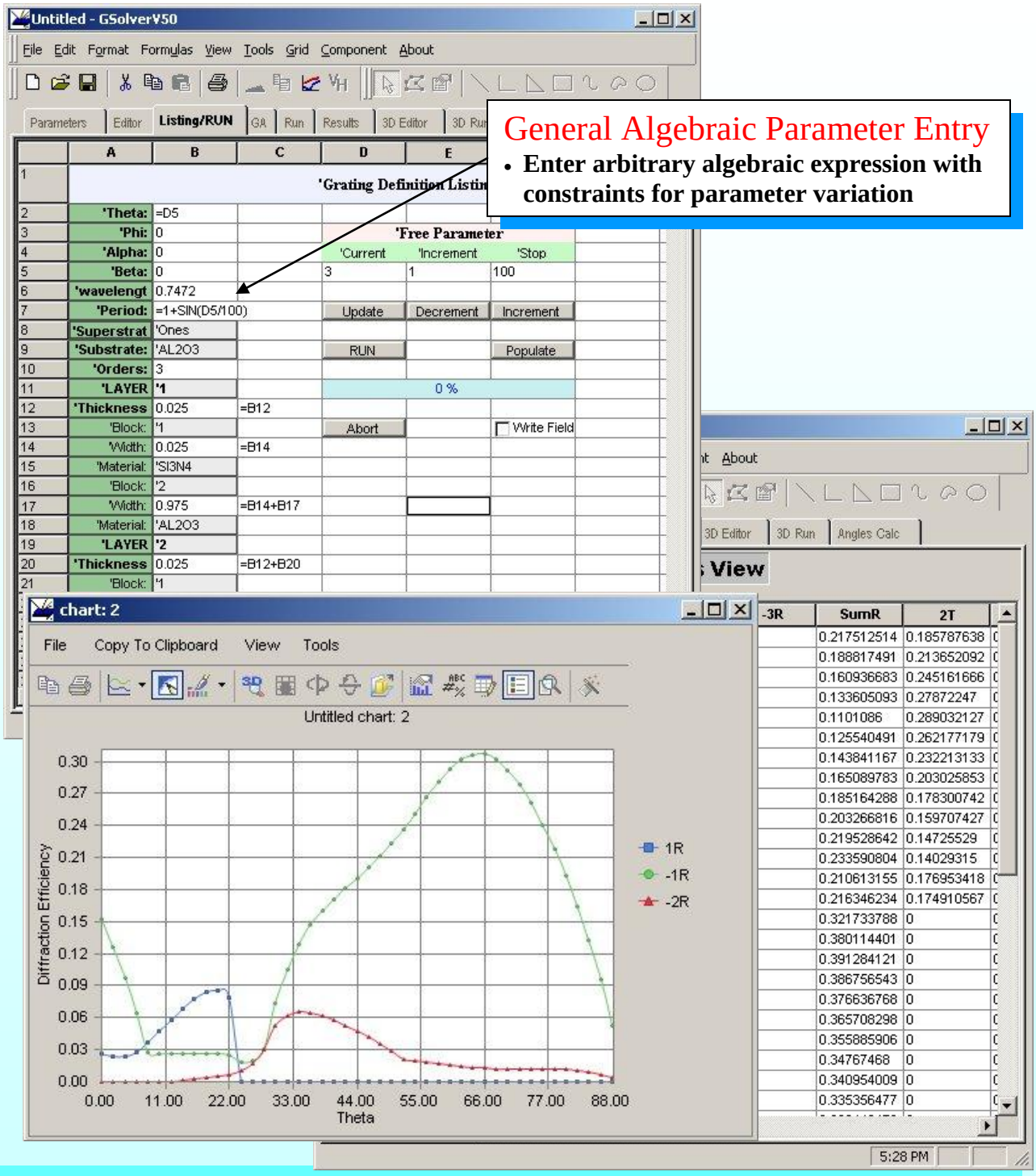
Define illumination, plane wave k-vector with two polar angels, theta, and phi, and two polarization angles, alpha, and beta (this permits general polarization selection)

Refractive Index Catalog -

- **Nobel Metals (Drude Model)**
- **Glass Catalogs (Schott, Corning, Hoya, O'Hara)**
- **IR Materials (Sellmeier, Herzberger)**
- **9th order polynomial (real and image)**
- **Table look-up**
- **Graphical coefficient editor**

- **Transverse, and crossed grating structures are fully supported**
- **General polarization, and angle of incidence including conical mounts**

GSOLVER© V5.2 Flexible Execution Control

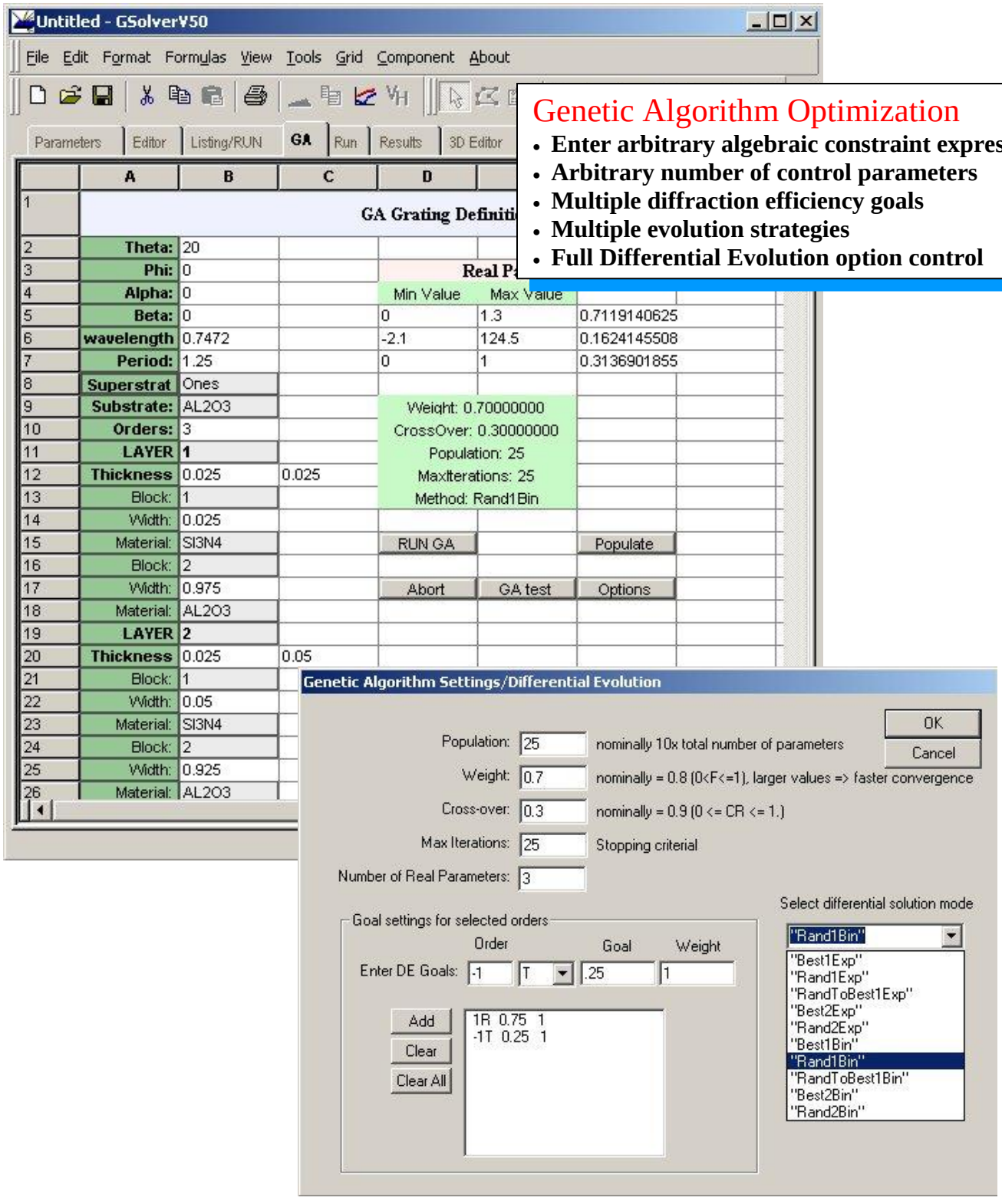


General Algebraic Parameter Entry

- **Enter arbitrary algebraic expression with constraints for parameter variation**

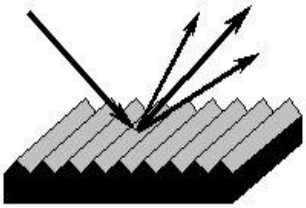
GSOLVER V5.2 features optimized algorithms that solve the full vector Maxwell equations in the grating region. Arbitrarily complex grating structures made of an arbitrary number of materials specified by piecewise constant model. The algorithm is based on a 'Rigorous Coupled Wave' method using Stack matrix methods to solve for the interlayer boundary conditions. Specializations are used to speed convergence for arbitrary polarization. Optimizations for TE and TM polarization modes are also included.

GSOLVER© V5.2 Genetic Algorithm – Differential Evolution



Genetic Algorithm Optimization

- **Enter arbitrary algebraic constraint expressions**
- **Arbitrary number of control parameters**
- **Multiple diffraction efficiency goals**
- **Multiple evolution strategies**
- **Full Differential Evolution option control**



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Dear Diffraction Grating Designer,

Thank-you for your interest in GSOLVER. A fully functional demo version of the GSOLVER program is available free. The download site is http://www.gsolver.com/thanks.htm.

The demo program does not support file I/O (you cannot save grating structure files or results). It is also limited to a total of ten layers in the piecewise constant approximation. There are several example calculations in the users manual (download from the web site). If you have questions about GSOLVER please FAX, or e-mail them and you will receive a prompt response.

GSOLVER may be used to reproduce numerous rigorous diffraction calculations published in the literature. A few (among many) literature examples are

1. M.G. Moharam, T.K. Gaylord, 'Diffraction analysis of dielectric surface-relief gratings,' JOSA 72, 1385(82).
2. L. Li, 'Multilayer modal method for diffraction gratings of arbitrary profile, depth, and permitivity,' JOSA –A 10, 2581(93).
3. L. Li, C.W. Haggans, 'Convergence of the coupled-wave method for metallic lamellar diffraction gratings,' JOSA-A 10, 1185(93).
4. T.K. Gaylord, W.E. Baird, M.G. Moharam, 'Zero-reflectivity high spatial-frequency rectangular-groove dielectric surface-relief gratings,' Apl. Opt. 25, 4562(86).
5. M.G. Moharam, T.K. Gaylord, 'Rigorous coupled-wave analysis of metallic surface-relief gratings,' JOSA-A 3, 1780(86).
6. T.K. Gaylord, M.G. Moharam, 'Analysis and Application of Optical Diffraction by Gratings,' Proc of the IEEE 73, 894(85).
7. E.G. Loewen, M. Neviere, D. Maystre, 'Grating efficiency theory as it applies to blazed and holographic gratings,' Apl.Opt. 16,2711(77).

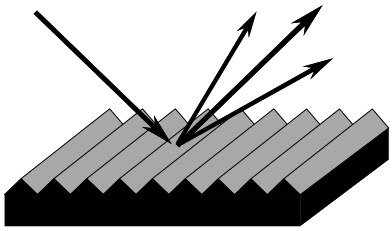
See also:
B.E. Popov, L. Tsonev, D. Maystre, 'Lamellar metallic grating anomalies,' Apl. Opt. 33, 5214 (94).
T. Glaser, S. Schroter, H. Bartelt, H. Fuchs, E. Kley, 'Diffractive optical isolator made of high-efficiency dielectric gratings only,' Applied Optics, Vol. 41, No. 18/20 June 2002.

S.C. Barden, J.A. Arns, W.S. Colburn, J.B. Williams, 'Volume-Phase Holographic Gratings and the Efficiency of Three Simple VPH Gratings,' Publications of the Astronomical Society of the Pacific, June 2000. (NOAO Preprint No 869)

See IEEE Spectrum June 1998 issue for a review of GSOLVER in 'Software Reviews'.

GSOLVER is based on a full vector implementation of rigorous coupled wave theory. This reduces the solution of (the interlayer) Maxwell equations to an algebraic eigenvalue problem. The intralayer boundary conditions are solved using Stack-matrix methods. Application of the piecewise constant approximation to the grating region permits arbitrary grating structure realization. Calculations are limited by 64bit floating point accumulations of the Intel hardware, and the truncation order parameter.

Sincerely,
David Fluckiger



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Price List for GSOLVER

GSOLVER V5.2 **(for Windows OS)**	**$ 795.00**
GSOLVER V5.2L **(lite version)**	**$ 195.00**

GSOLVER V5.2 is a full 32-bit integrated executable for Windows OS.

Customers are responsible for any duties and taxes. Texas customers must add applicable state sales tax (8.25%). All orders F.O.B. Allen, Texas, U.S.A.

We generally ship within two business days of receipt of Purchase Order.
We do not accept credit cards.
We are a small business
Please supply shipping and billing address and Technical Point of Contact