



Software

SIMNRA 7 software

1801-4849-WT-WA

Technology

SIMNRA is a Microsoft Windows program for the simulation of energy spectra for ion beam analysis with incident ions from about 100 keV to many MeV. SIMNRA can be used for the simulation of Rutherford backscattering (RBS), elastic backscattering with non-Rutherford cross-sections (EBS), nuclear reaction analysis (NRA), elastic recoil detection analysis (ERDA), and medium energy ion scattering (MEIS). Almost 3000 different non-Rutherford and nuclear reactions cross-sections for incident protons, deuterons, ^3He , ^4He and Li-ions are included. SIMNRA can calculate any ion-target combination including incident heavy ions and any geometry including transmission geometry. Arbitrary foils in front of the detector and arbitrary beam windows are possible.

The cross-section calculator SigmaCalc by A. Gurbich allows to calculate cross-section data for backscattering and nuclear reactions for many ion-target combinations at any angle: This allows unsurpassed accuracy for the simulation of a large number of elastic backscattering and nuclear reaction analysis measurements.

Main features:

Fully graphical user interface with support for high-resolution devices

Available stopping powers: SRIM 2003 or higher, Konac et al. (for C and Si targets), Ziegler-Biersack (identical to SRIM 97), Andersen-Ziegler, user defined

Energy loss straggling: Bohr straggling, Chu correction to Bohr straggling, straggling due to charge state fluctuations, propagation of straggling in thick layers

Geometrical straggling due to finite beam width and detector aperture

Multiple small angle scattering, identical to E. Szilágyi's DEPTH code

Plural large angle scattering

Accurate simulation of narrow resonances in the cross-section

Surface roughness (rough layers, rough substrate)

Sample porosity

Roughness of foils in front of the detector and roughness of beam windows

Live time correction and pile-up simulation, pile-up correction of experimental data

Detector types: Solid-state detectors, thin (transmission) detectors, time-of-flight detectors, electrostatic detectors

Data fitting (layer thicknesses, compositions etc.) by means of the Simplex algorithm

Data analysis tools: Calculation of scattering kinematics, stopping, peak integrals, positions of elements, ...

OLE automation for automatic analysis of large numbers of spectra or development of new codes

Read/write of data files in IBA data format (IDF) for easy exchange of data

All technology offers

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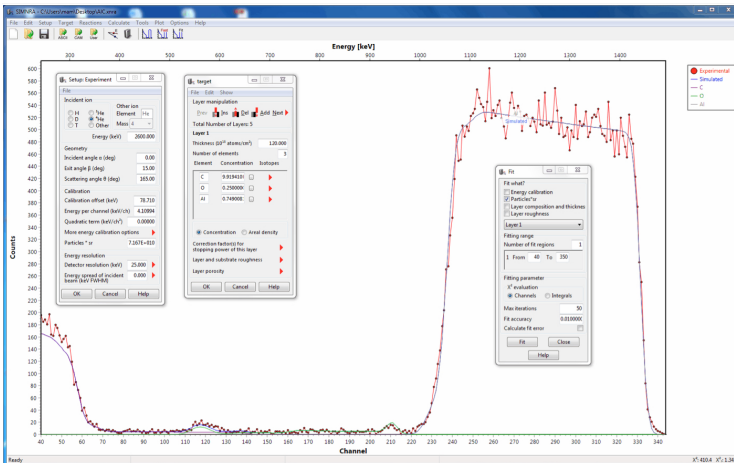
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with other simulation programs

Smooth integration into the windows environment by thumbnail preview images of data files, display of file properties, and integration into Windows Search



Single User license for SIMNRA (version 7.0) without source code:

400 EUR (with SigmaCalc)

250 EUR (without SigmaCalc)

Campus License for 5 and more users:

2.000 EUR (with SigmaCalc)

1.250 EUR (without SigmaCalc)

For 1 - 4 users only individual single user licenses are available. The above price includes:

1. The license fee for a non-exclusive right to use the software program.
2. The software and manual in PDF format.

Download:

<http://home.mpcdf.mpg.de/~mam/Download.html>

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Literature:

SIMNRA home page: <http://www.simnra.com>

SIMNRA User's Guide:

<http://home.mpcdf.mpg.de/~mam/Manual.pdf>

M. Mayer, *Improved Physics in SIMNRA 7*, Nucl. Instr. Meth. B 332 (2014) 176,

<http://home.mpcdf.mpg.de/~mam/NIM B332-176.pdf>

M. Mayer, *SIMNRA, a Simulation Program for the Analysis of NRA, RBS and ERDA*, Proceedings of the 15th International Conference on the Application of Accelerators in Research and Industry, J. L. Duggan and I.L. Morgan (eds.), American Institute of Physics Conference Proceedings 475, p. 541 (1999), <http://home.mpcdf.mpg.de/~mam/AIP 475-541.pdf>