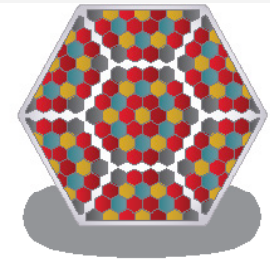
HELIOS | GENERALIZED-GEOMETRY LATTICE PHYSICS CODE

"HELIOS-2 is a two-dimensional, generalized-geometry lattice physics transport code. By including the latest nuclear data and substantially expanded modeling capability, HELIOS-2 reaches far beyond the capabilities of previously available versions."

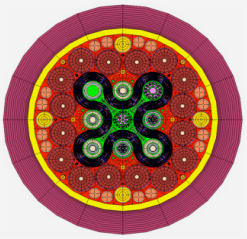


HELIOS has successfully modeled hundreds of VVER core cycles.

The Flexibility You Need

The generalized geometry and computational options in HELIOS-2 allow the modeling of any imaginable fuel design. There are no restrictions on lattice or geometry types.

HELIOS-2 is capable of analyzing fuel used in bothc onventional and non-conventional civil nuclear reactor designs. It can perform complex physics calculations for non-LWR lattices (CANDU, PHWR, Magnox, RBMK) and experimental reactors, like MTR and TRIGA.



HELIOS models geometries including this "Cloverleaf" shaped core.

HELIOS-2 has also been used to analyze hundreds of cycles of VVER operation. Even non-standard fuel designs, such as curved plates and unstructured liquid or gas fuels, are easy to model/analyze in HELIOS-2.

Improved Modeling Detail

Exploiting the power of today's computational hardware, HELIOS-2 requires fewer approximations and performs more rigorous solutions than the previous generation of lattice physics codes.

The addition of a Method of Characteristics solver allows larger models, such as multiple fuel bundles and fractional cores, to be calculated with fewer required computing resources.

Accuracy

HELIOS-2 has been extensively validated against measured critical experiments, continuous-energy Monte Carlo calculations, and international isotopic benchmarks. HELIOS-2 delivers exceptional accuracy for traditional, non-traditional, and experimental fuel designs.

Database-Driven Design

Inter-module data communication is performed via a database structure, allowing calculation results to be easily archived and retrieved. This database architecture also supports simultaneous analysis of results from multiple cases and creation of burned fuel data banks for spent fuel pool analysis, shuffling and core management, or reinsertion into the core.

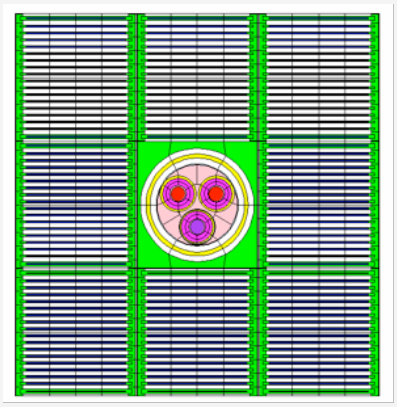
ENDF/B-VII: Toward Better Data

Using the most recent ENDF/B-VII nuclear data available, Studsvik has developed a high-resolution, 177-group neutron library for use with HELIOS-2. This extensive update from the previous HELIOS library improves accuracy and enhances resonance treatments. HELIOS-2 also includes an updated 48-group gamma library for gamma transport and smearing calculations. Cross-section data is available for more than 350 nuclides and materials.

With data available for more than 175 fission products and 40 heavy nuclides, this library is state-of-the-art in every sense.

Ease of Use

The HELIOS-2 system includes an interactive geometry rendering module to assist with input development.



Complex geometries can be modeled in HELIOS

Capable of displaying the full system and individual components, this module displays edit areas and geometry, material and temperature assignments, so you get your model right the first time. Input data sets can be written to the central database structure so that fixed or common data is centrally available without the need to re-enter data.

Methodology

HELIOS-2 transport calculations may be performed with either a collision probabilities or Method of Characteristics solver. Resonance self-shielding is calculated via the subgroup method, with a transport-based Dancoff calculation.

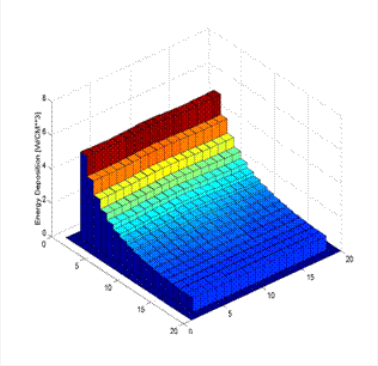
Requirements for HELIOS-2

Written entirely in Fortran-90, HELIOS-2 is supported on all standard computing platforms running most modern 32- and 64-bit operating systems. Linux, Windows, and UNIX architectures are all acceptable environments for HELIOS-2 software.

Unparalleled Customer Support

Studsvik has extensive experience in helping our customers implement our products and get up and running quickly. Introductory, refresher and advanced training courses are offered throughout the year. Studsvik User Group Meetings give our customers the opportunity to build relationships with Studsvik product developers and engineers while learning about new techniques and products.

Studsvik's technical support is built on putting the needs of our customers first. Our nuclear engineering staff are here to help.



The output processing module allows edits to be manipulated, combined, and compared to results from other calculations and experimental data.

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