Studsvik

HELIOS2

Generalized-Geometry Lattice Physics Code

HELIOS2 is a two-dimensional, generalized-geometry lattice physics transport code and includes the latest nuclear data available with expanded modeling capability.

The Flexibility You Need

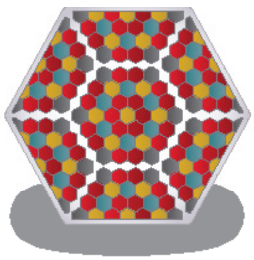
The generalized geometry and computational options in HELIOS2 allow the modeling of any imaginable fuel design. There are no restrictions on lattice or geometry types.

HELIOS2 is capable of analyzing fuel used in both conventional and unconventional 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.

HELIOS2 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 HELIOS2.

Accuracy

HELIOS2 has been extensively validated against measured critical experiments, continuous-energy Monte Carlo calculations, and international isotopic benchmarks. HELIOS2 delivers exceptional accuracy for traditional, non-traditional, and experimental fuel designs.



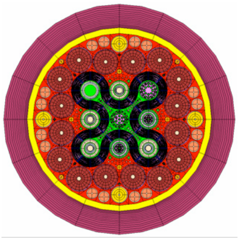
HELIOS2 has modeled hundreds of VVER core cycles

Improved Modeling Detail

Exploiting the power of today's computational hardware, HELIOS2 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.

HELIOS2 models geometries including this "Cloverleaf" shaped core.



HELIOS2 is the leading generalized geometry lattice physics code, with flexibility to support non-traditional 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.

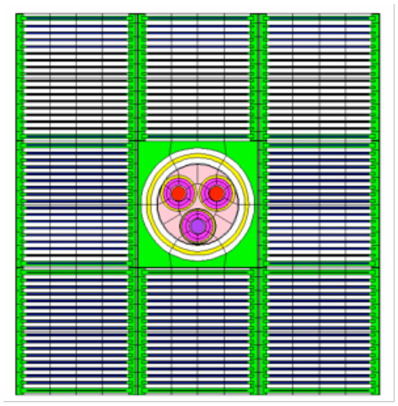
ENDF/B-VII.1: Toward Better Data

Using the most recent ENDF/B-VII nuclear data available, Studsvik has developed a high-resolution, 316-group neutron library for use with HELIOS2. This extensive update from the previous HELIOS library improves accuracy and enhances resonance treatments. HELIOS2 also includes an updated 48-group gamma library for gamma transport and smearing calculations. Cross-section data is available for more than 1450 nuclides and materials.

With data available for more than 700 fission products and 150 heavy nuclides, this library is state-of-the-art in every sense.

Ease of Use

The HELIOS2 system includes an interactive geometry rendering module to assist with input development.

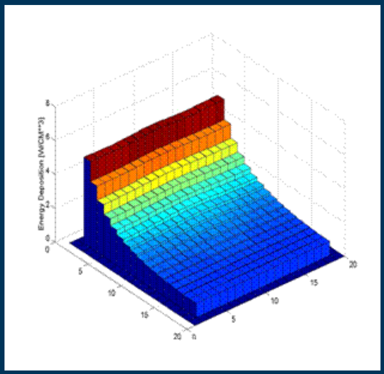


Complex geometries can be modeled in HELIOS2

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 are written to the central database structure so that fixed or common data is centrally available without the need to re-enter data.

Methodology

HELIOS2 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.



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

Requirements

Written entirely in Fortran 90, HELIOS2 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 HELIOS2 software.

Unparalleled Customer Support

Studsvik's technical support is built on putting the needs of its customers first.

- 24-hour response time
- Easy ticketing system
- On-line support portals
- Access to technical documentation
- Active and growing user communities of practice

For further information please contact:

Your Studsvik representative or
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