
Summary of New Features

The following new items are included in this official release version of FRED 22.40:

FRED^{MPC} (GPU raytracing and analyses)

- MPC ray traces now support polarization, bringing the trace speed gains of GPU's to polarization sensitive optical systems
- ABg scatter has been added to the supported list of surface scatter models for MPC.
- MPC's post-raytrace path merging process is now many hundreds of times faster.
- Five new advanced parameters have been added to the MPC raytrace, including an option to copy GPU parent rays back to the CPU ray buffer for subsequent analysis.
- Considerable time has been invested making MPC Raytrace code improvements such that the ray ancestry assignments, ray ancestry threshold enforcement, and surface incident/absorbed powers now match the CPU trace results in an even wider variety of cases.

General Updates

- FRED now supports two new types of volume scattering, via newly added Gegenbauer and Mie volume scattering models. Additionally new ray filters have been added to isolate volume scattered rays.
- Aacktar surface scatter models have been added to the scatter catalogue for FractalBlack, HexaBlack, LambertianBlack, MagicBlack, MaxiBlack, MetalVelvet, ScatterBlack and VacuumBlack. Models are available for both the visible and Infrared ranges.
- The image export tool now supports exporting Images at arbitrary user defined resolutions.
- Eight new ray path filters have been added to aid with path analysis. The new filters are based on the column headings of the Path Summaries table and therefore include items such as Total Ray Powers, Total Ray Counts, as well as the various "Event Count" headers.
- The Glass Catalogues of Hikari, Hoya, NHG, and Sumita have been updated.

Miscellaneous Updates and Bug Fixes

In addition to the improvements described above, this release contains several smaller features and bug fixes. Please refer to the Release Notes found on the Help menu inside of FRED for a complete listing of all enhancements and defect resolutions.