

Need the latest ORIGEN-ARP capabilities? Get SCALE 5.

Several major upgrades of the ORIGEN nuclear data have been implemented, and these upgrades are now available in SCALE 5.

(1) Replacement of the basic neutron reaction cross sections (compiled from cross section evaluations from the 1960's) with current evaluations from ENDF/B-VI, the European Activation File (EAF-99), and FENDL-2 data. The update resulted in 854 nuclides with evaluated cross section data, an increase from 567 in the previous ORIGEN-S library and 692 in current ORIGEN2 libraries.

(2) Upgrade and expansion of the fission product yields from ENDF/B-V to the latest 1993 revision of ENDF/B-VI, release 2 (ENDF/B-VI.2), increasing the number of fission products from 879 to 1119.

(3) Expansion of the actinides with explicit fission product yields from 5 to 30. The addition of yields for higher-order actinides is designed to address data requirements for actinide transmutation studies. The addition of explicit yields improves fission product inventory and decay property predictions.

(4) Upgrade of the photon emission line-energy data from ENDF/B-VI, ENSDF, and JEF-2.2 evaluated data. This update yielded 2101 nuclides with photon data, compared to just 418 nuclides in the previous library. The new library contains gamma rays emitted from the nucleus during α , β , electron capture, and isomeric transitions, characteristic fluorescent X-rays from electron capture or emission of internal conversion electrons, and photons from positron annihilation. Continuum spectra are binned as pseudo-line data. The new library has about 115,000 individual photon lines, compared to 12,000 lines in the previous library. The new library gives improved gamma spectral calculations, particularly at short cooling times, and corrects a number of deficiencies previously identified in the library.

(5) The ORIGEN-ARP methods have been expanded to allow the analysis of MOX fuel. MOX cross-section libraries for most European MOX reactor types and fuel assembly designs are now included. New cross-section libraries for MAGNOX, AGR, VVER 440 and VVER 1000 reactors have been added too.

ORIGEN-ARP Version 5.1 Is Planned for Release in 2005

This standalone depletion package for users who don't want the entire SCALE package will contain a new version of the OrigenArp Windows user interface that includes an option for target activation calculations. The new version number will reflect the version of SCALE from which ORIGEN-ARP was packaged. In the future, new versions of the SCALE and ORIGEN-ARP packages will be released simultaneously and will have the same version number.

The anticipated release date for ORIGEN-ARP 5.1 is September 2005. The website will be updated when a final release date is set.