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LISE++ development: Abrasion – Fission OLEG TARASOV, NSCL / MSU — The fission of 238 U is induced by both electro-magnetic and nuclear processes. At large impact parameters and for high-Z targets, the long-range Coulomb force prevails (Coulomb fission). For smaller impact parameters, peripheral nuclear collisions take place and the fissile projectile is left abraded and excited (Abrasion-Fission). After de-excitation by nucleon emission, it can undergo fission with a finite probability. Coulomb Fission and Abrasion-Fission are both included in the production cross section calculations in the latest version of the LISE++ code (www.nscl.msu.edu/lise). Abrasion-Fission is significantly more difficult to model since there are more than 100 fissile nuclei produced after the initial abrasion stage of the fast heavy projectile (there is only one fissile nucleus in the case of Coulomb fission). To overcome this problem, the LISE code models the Abrasion-Fission fragment production with three excitation energy regions. Post-scission nucleon emission is the final stage. Use of the LisFus method to define the number of post-scission nucleons is a big advantage of the LISE++ code that allows one to observe shell effects in the TKE distribution, and enables the user to make a rapid qualitative estimate of the final fission fragment yield. Another advantage of the code is the speed of its calculations. Kinematic models of the fission process are used to perform the fragment transmission calculations and estimate the fragment rates at the end of spectrometer.

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