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MCPR – A Monte Carlo model for studies of Fragmentation Reactions HANNAH STALEY, Bryn Mawr College, JORGE PEREIRA, NSCL, BRYN MAWR COLLEGE COLLABORATION, NSCL COLLABORATION — Fragmentation reactions are nowadays one of the most successful mechanisms to produce new unknown nuclear species. Nuclear reactions have the standard direct and compound-nucleus reactions components. Also there exists abundant evidence of an intermediate process that seems to fall in between these two types, and is more than just a combination of them. This in between state, the so-called pre-equilibrium stage, is less clearly understood. So, there are many models to describe pre-equilibrium reactions. In the present work, a systematic study of fragmentation-reaction data has been carried out, using the new Monte Carlo Pre-equilibrium code MCPR. The model combines a pre-equilibrium stage with the ABLA evaporation model, based on the statistical de-excitation model. Particle spectra; angular distributions; fragment distributions; excitation functions, along with production cross sections, were calculated for a large group of reactions. We particularly are interested in energies and elements studied at the National Superconducting Cyclotron Laboratory, NSCL. Here energies of 80 to 150 MeV/u and masses $\sim A=20-200$ are typically used.

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