Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

An evaporation-based model of ternary fission JOHN LESTONE, Los Alamos — Large amounts of neutron-induced, spontaneous, and heavy-ion induced ternary-fission data are analyzed within the frame work of an evaporation-based model where the complexity of time-varying potentials are included in a simplistic fashion. A free parameter which controls the height above the rupture location beyond where quasi-evaporated particles become ejected ternary-fission fragments following the rapid collapse of the necking material is adjusted to reproduce ternary-fission emission probabilities. The observed dependence of this parameter on the mass and charge numbers of the light charged particles is consistent with a neck collapse time of $\sim 10^{-22}$ s. Without any additional adjustment to model parameters, the observed trends in the energy spectra and angular distributions of the ternary-fission particles are reproduced. The calculated ratio of the first 2^+ to ground-state population probabilities for ejected ^{10}Be ions is 0.155, in agreement with experiment. There are indications that the neck collapse time increases with nuclear temperature. The success of the model implies that ternary fission is caused by the evaporation of particles from a rapidly changing fluid.

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Date submitted: 17 May 2005 Electronic form version 1.4