

TIME-DEPENDENT MEASUREMENT OF N-Z EQUILIBRATION

A.B. McIntosh¹, A. Jedgele^{1,2} and S.J. Yennello^{1,2}

¹Cyclotron Institute, Texas A&M University

²Chemistry Department, Texas A&M University

We measure neutron-proton equilibration as a function of time. To achieve this, we examine dynamical decay of nuclei that are transiently deformed in heavy-ion collisions. The collision creates a neck zone that is neutron-rich at the expense of the projectile and target. After neck rupture, the n-p imbalance in the deformed projectile-like fragment (PLF*) tends back toward equilibration. The equilibration is frozen out when the deformed PLF* breaks into two. By measuring the isotopic composition of both daughters of the PLF*, we observe the composition of the two approach each other exponentially as a function of the breakup orientation. The breakup orientation of the PLF* is related to time via angular momentum, which we assess using the out-of-plane angular distribution. This exponential shape of the equilibration curves indicates first-order kinetics, and rate constants are extracted.