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A Geant4 simulation for DSAM lifetime measurements at low recoil velocities[1] MALLORY SMITH, Central Connecticut State; WNSL, Yale University, J. RUSSELL TERRY, WNSL, Yale University — Lifetimes of low-spin excited states can be determined by populating such states in light-ion fusion-evaporation reactions. Reduced transition probabilities derived from these measurements provide a sensitive test for low-energy nuclear structure models. The Doppler shift attenuation method (DSAM) is a common, flexible technique used to resolve lifetimes for stable and unstable isotopes on the order of hundreds of femtoseconds. DSAM is typically employed in heavy-ion fusion-evaporations, in which nuclei have high recoil velocities and introduce high angular momenta to the compound system. However, these reactions generally populate high-spin and yrast states. We explore the possibility of using DSAM to extract lifetimes from low-spin, non-yrast states, using light-ion-induced fusion-evaporation, where the nuclear recoil velocity is small. A Geant4 simulation was created to test the viability of using light ions to measure lifetimes. From the simulation, the minimum required bombarding energy was ascertained.

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