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Lifetime of the first excited state in ^{64}Ge using the time-of-flight method. ATHENA DUNOMES, Michigan State University, National Superconducting Cyclotron Laboratory — Picosecond lifetime measurements using the relativistic time-of-flight plunger method were performed at the NSCL from fragmentation and knockout reactions. The experiment was aimed at the predicted 5.4 ps lifetime of the ^{64}Ge first excited state and tested the limits of the method. The ^{65}Ge beam was delivered from the A1900 separator and impinged on the target of the plunger. The ensuing single neutron knockout reaction produced ^{64}Ge nuclei. These excited nuclei emerged from the target and decayed in flight after a distance corresponding to the lifetime. A moveable reset foil positioned downstream from the plunger target was used to reduce the velocity of the investigated nuclei. As a consequence, the gamma rays, which decayed from the excited states before and after the degrader foil, were detected at different Doppler shifts by a modified Segmented Germanium Array setup with forward and backward rings at 30° and 140° with respect to the beam axis. The obtained decay curve provides information about the lifetime since the distance between the target and degrader foils and beam velocity are known. The result of the lifetime measurement will be presented.

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