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Doppler-shift lifetime measurements in ^{84}Kr using the TIGRESS Integrated Plunger AARON CHESTER, Simon Fraser University — Intense re-accelerated beams delivered by the ISAC-II facility at TRIUMF, Canada's national laboratory for particle and nuclear physics, permit access to nuclear structure information for a wide range of radionuclides via in-beam gamma-ray spectroscopy with TIGRESS, a high-efficiency and Compton-suppressed segmented HPGe array. To take advantage of this opportunity, the TIGRESS Integrated Plunger (TIP) has been constructed at Simon Fraser University [1]. The TIP infrastructure supports Doppler-shift lifetime measurements via the Recoil Distance Method (RDM) using a 24-element TIP CsI(Tl) wall for charged-particle identification. A commissioning experiment aimed towards a high-precision ($< 10\%$) measurement of the $B(E2, 2_1^+ \rightarrow 0_1^+)$ reduced transition probability in ^{84}Kr was performed in October 2015 using inelastic scattering near the Coulomb barrier coupled with an RDM lifetime measurement of the stable ^{84}Kr beam. A Geant4-based code for TIP is being developed as a tool to aid the analysis and for the optimization of future experiments. The device, experimental approach, analysis, and preliminary results will be presented and discussed. This work is presented on behalf of the TIP and TIGRESS collaborations. [1] P. Voss et al., NIMA 746 (2014) 87.

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