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Study of ^{22}Ne and ^{28}Mg excited states using fusion-evaporation and Doppler shift measurements JONATHAN WILLIAMS, Simon Fraser University, TIGRESS COLLABORATION[1] — Electromagnetic transition rate measurements serve as a fundamental probe of nuclear structure and provide a stringent test for theoretical models. Doppler shift lifetime measurements offer an opportunity to directly access information about electromagnetic transition rates and discriminate between model calculations. The TIGRESS Integrated Plunger device (TIP), constructed at SFU, supports Doppler shift lifetime measurements via gamma-ray spectroscopy with the TIGRESS segmented Ge array as part of the experimental program at the ISAC-II facility of TRIUMF. A recent study using TIP employs the fusion-evaporation reaction of ^{18}O + ^{12}C at beam energies of 56 and 48 MeV, with reaction channel selection provided via coincident charged particle detection using ancillary CsI(Tl) detectors. Transitions were identified belonging to the 2 alpha particle and 2 proton evaporation channels from the compound system ^{30}Si, corresponding to ^{22}Ne and ^{28}Mg respectively. Lineshapes, from which lifetimes can be determined by comparison to simulated data, have been observed for these transitions. The experimental approach, analysis procedure, and preliminary comparison of lineshapes to simulations using the GEANT4 toolkit will be discussed.

[1]The TIGRESS experiment at ISAC-II at TRIUMF, Vancouver, BC.

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