Structure of $^{69}$Br and the rp-process in X-ray bursts\textsuperscript{1} CAROLINE NESARAJA, MICHAEL SMITH, Oak Ridge National Laboratory — The long (35.5 sec.) positron decay lifetime of $^{68}$Se, coupled with the low estimated probability of proton capture into $^{69}$Br, make $^{68}$Se a waiting point in the rp-process powering explosions in X-ray binaries. The thermonuclear reaction flow in X-ray bursts (XRB) depends sensitively on the properties of $^{69}$Br, especially whether or not the ground state is proton bound [1]. Recent studies of the mass of $^{68}$Se and the decay of $^{69}$Br prompt a reassessment of the $^{69}$Br properties relevant for rp-process burning in XRB. In our current project to evaluate the structure of nuclei with mass 69, we will focus on $^{69}$Br. Our assessment, which will be included in the ENSDF database at the U.S. National Nuclear Data Center, will be used to generate a new reaction rate for proton capture on $^{68}$Se, and subsequently for new X-ray burst nucleosynthesis calculations.


\textsuperscript{1}ORNL is managed by UT-Battelle, LLC for the U.S. DOE under contract DE-AC05-00OR22725