

Abstract Submitted  
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**Investigation of Relaxation Process in  $D_2O^{2+}$  leading to  $D^+ + O^+ + D$  fragmentation channel** WAEL ISKANDAR, KIRK LARSEN, BRANDON GRIFFIN, Lawrence Berkeley National Laboratory, BETHANY JOCHIM, TRAVIS SEVERT, ITZIK BEN ITZHAK, Kansas State University, DANIEL SLAUGHTER, THORSTEN WEBER, Lawrence Berkeley National Laboratory — We present investigation of relaxation dynamics on heavy water molecules after single photo double ionization. The experiments were performed at beamline 10.0.1.3 at the Advanced Light Source in Berkeley using XUV of 61 eV. A COLd Target Recoil Ion Momentum Spectroscopy (COLTRIMS) was employed to measure in coincidence the 3D momenta of the emitted ions and electrons. Among multiple fragmentation channels arising from the dissociation of  $D_2O$  dication, a very weak channel  $D^+ + O^+ + D$  is present. For this channel, we were able to identify and separate the autoionization process from the direct two electrons emission process. For the direct one, preliminary results show two distinct electronic states contributing to the fragmentation channel and that these  $D_2O^{2+}$  states undergo sequential dissociation into  $D^+ + O^+ + D$ .

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