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Photo-ion photo-electron coincidence study of methanol fragmentation by XUV pump and NIR probe pulses SEYYED JAVAD ROBATJAZI, SHASHANK PATHAK, ANBU VENKATACHALAM, KANAKA RAJU P, JEFFERY POWELL, SURJENDU BHATTACHARYYA, DANIEL ROLLES, ARTEM RUDENKO, Kansas State University, KANSAS STATE UNIVERSITY TEAM — Ionization and fragmentation of a methanol molecule has been studied in a pump probe experiment employing coincident velocity map imaging of resulting photoions and photoelectrons. The molecules photoionized by a 30 fs XUV high harmonics pulse were dissociated or further ionized by a near-infrared (790 nm) probe pulse arriving at variable time delays. The channel-selective yields, kinetic energies and angular distributions of the photoions and photoelectrons were recorded as a function of XUV-NIR delay. We compare the results obtained employing a single (13th) harmonic or a train of harmonics (13th to 27th). While in the former case the outcome of the experiment is dominated by the dynamics in low-lying cationic states and the final products are mainly singly charged, the latter configuration often results in double ionization and populates many highly-excited cationic states. We observe H_3^+ ion formation in both singly or doubly charged final states, and trace signatures of hydrogen migration resulting in the ejection of OH_2^+ and OH_3^+ fragments.

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