

## VELOCITY MAP IMAGING STUDIES OF NON-CONVENTIONAL METHANETHIOL PHOTOCHEMISTRY

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Velocity map imaging (VMI) in combination with state-selective resonance enhanced multiphoton ionization (REMPI) has been used to study the photodissociation dynamics of methanethiol following excitation to the first and second singlet electronically excited states. Formation of sulfur atoms, in both the singlet and triplet manifolds, is observed and can be attributed to primary dissociation of the parent molecule. We will report the nascent photofragment velocity distributions, and hence the internal energy of the methane co-fragment. Sulfur atom quantum yields are benchmarked against a known standard to evaluate the significance of this pathway. The role of non-conventional photochemical mechanisms such as roaming-mediated intersystem crossing, previously observed in methylamine photochemistry,<sup>a</sup> will be discussed.

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<sup>a</sup>James O. Thomas, Katherine E. Lower, and Craig Murray, *The Journal of Physical Chemistry Letters*, 2012, 3 (10), 1341-1345.