METHANOL PHOTODISSOCIATION BRANCHING RATIOS AND THEIR INFLUENCE ON INTERSTELLAR ORGANIC CHEMISTRY

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Methanol is the most abundant organic molecule in interstellar ices, and its photodissociation is the dominant source of organic radicals in these ices. These organic radicals become mobile and react in warm (>30 K) environments. Such combination reactions lead to a variety of complex organic molecules with differing structural arrangements of organic functional groups. It is plausible, then, that methanol photodissociation branching ratios directly impact the relative abundances of structural isomers observed in interstellar environments. Previous laboratory investigations of the methanol photodissociation process yielded disparate results, and few of these experiments were conducted under conditions that can be directly applied to interstellar chemistry. We are therefore undertaking a combined laboratory spectroscopy and astrochemical modeling investigation of the methanol photodissociation reaction mechanism. In this talk, we will present our progress towards developing a submillimeter spectrometer designed to probe the gas-phase photodissociation branching ratios of methanol. We will also report on the results of an astrochemical modeling study that tests the influence of methanol photodissociation branching ratios on complex interstellar chemistry.