

Abstract Submitted  
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**Comparison of laser-induced fragmentation channels of  $\text{CS}^+$  and  $\text{CO}^+$ : a study in chemically similar molecules**<sup>1</sup> K.J. BETSCH, T. SEVERT, U. ABLIKIM, M. ZOHRABI, B. JOCHIM, K.D. CARNES, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506, USA — In an effort to address how well the idea of chemically similar molecules extends into strong field phenomena, we explore similarities and differences in ultrafast laser-induced fragmentation channels from  $\text{CS}^+$  and  $\text{CO}^+$  molecular ion beams. We find similar fragmentation channels and features of interest, such as a laser-intensity-dependent high kinetic-energy-release (KER) peak in the dissociation channels of both molecules. However, molecule-specific features, such as the relative abundances and KERs of individual channels, are also observed. For example, we observe that, in the asymmetric-charge breakup channel  $\text{CS}^+ \rightarrow \text{CS}^{2+} \rightarrow \text{C} + \text{S}^{2+}$ , the carbon atom is neutral. This is opposite to the asymmetric-charge breakup from  $\text{CO}^+$ , where the carbon fragment carries the charge. Based upon their chemical similarity, we would expect similar asymmetric breakup for the two molecules. We will discuss why the actual behavior differs from our expectations.

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