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**Isotopic Pulse Length Scaling of $H_2^+$ Dissociation in an Intense Laser Field**[1] JIANJUN HUA, BRETT ESRY, J.R.Macdonald Laboratory, Department of Physics, Kansas State University — We will show that scaling the length of an intense, short laser pulse by the mass ratio of $H_2^+$ and $D_2^+$ produces remarkably similar KER spectra — both in shape and in magnitude. $D_2^+$, and heavier molecules in general, have long been used experimentally since they move more slowly and thus produce effectively shorter pulses. We demonstrate, however, that this intuitive result actually leads to nearly quantitative agreement for $H_2^+$ and $D_2^+$ spectra for pulse lengths of $\tau$ and $\sqrt{2}\tau$, respectively. As the pulse length grows, the resemblence decreases since the differences in the vibrational structure begin to play an increasingly important role. The averaging necessary to compare with experiment, including intensity averaging and convolution with experimental resolution, help to widen the window of pulse lengths where this simple mass scaling applies.

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