Abstract Submitted
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Angle-resolved and internuclear-separation-resolved measurements of the ionization rate of the B state of I2 by strong laser ?elds[1] HUI CHEN, University of Connecticut, LI FANG, Western Michigan University, VINCENT TAGLIAMONTI, GEORGE GIBSON, University of Connecticut, GIBSON TEAM — For the first time, angle and internuclear separation resolved measurements of the single ionization rate of neutral I_2 have been obtained. By launching a wavepacket in the $B^3\Pi_u^+$ (B-state) of I_2 with a 50 fs tunable pump pulse we can measure the ionization rate as a function of internuclear separation as the wavepacket evolves in the B-state. Moreover, since the ground to B-state optical transition dipole moment is parallel to the internuclear axis, the B-state sub-population of the I_2 thermal ensemble will have a high degree of alignment, allowing for angular measurements. The B-state shows the well-known effect of enhanced ionization at a critical separation R_c with an enhancement factor of 22 when the ionizing field is polarized along the internuclear axis and the enhanced ionization decreases when the angle between the field and the axis increases from 0° to 90°, finally disappearing at 90°. These results on the enhanced ionization of the B-state of I_2 give the most precise determination of R_c for any molecule and agree extremely well with the prediction from a simple model of electron localization.

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