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Orientation effects in Coulomb explosion of H_2S in intense laser fields studied by coincidence momentum imaging AKIYOSHI HISHIKAWA, EIJI TAKAHASHI, Institute for Molecular Science, National Institute for Natural Sciences and The Graduate University for Advanced Studies (SOKENDAI) — The Coulomb explosion of H_2S in an ultrashort intense laser field (12 fs, 0.33 PW/cm^2), $H_2S^{3+} \rightarrow H^+ + S^+ + H^+$, has been studied by the coincidence momentum imaging method to study how the nuclear dynamics depends on the molecular orientation with respect to the laser polarization vector. When the molecular plane, defined as the plane spanned by the fragment momentum vectors, is perpendicular to the laser polarization vector (ε), the distribution of the total kinetic energy release E shows a peak at E = 21(1) eV. On the other hand, the distribution peak is observed at a substantially smaller value, E = 15(1) eV, when the molecular plane is perpendicular to ε, showing that the Coulomb explosion dynamics of H_2S depends sensitively on the orientation of the molecular frame to the laser polarization vector. The difference in the peak kinetic energies indicates that the geometrical structure for the perpendicular orientation is less elongated prior to the Coulomb explosion than that for the perpendicular orientation.

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