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Multichannel-resolved Dynamics in Below-threshold Harmonic Generation of Diatomic Molecules

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We present an ab initio quantum study of below-threshold harmonic generation (BTHG) from H_2^+ molecules in the presence of an intense laser field by solving the time-dependent Schrödinger equation accurately in space and time. We find that multiple channels contribute to BTHG of H_2^+ molecules, which are related to the electron driven initially at specific time of the laser pulse from one nuclear core to another nuclear core or back to the parent core itself. The distinct contributions of these channels are distinguished by using a novel synchrosqueezing time-frequency analysis. An intuitive physical picture discovered reveals electron dynamics in molecular BTHG in details for the first time.

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