

Abstract Submitted
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Deflection of field-free aligned molecules ILYA AVERBUKH, EREZ GERSHNABEL, Weizmann Institute of Science — We suggest a new approach to the efficient control of molecular interaction with inhomogeneous optical or static fields by *pre-shaping* molecular angular distribution with the help of short and strong femtosecond laser pulses. As an example, we consider laser deflection of CS_2 molecules that are field-free pre-aligned before entering the interaction zone. Manipulating the polarization of the pre-aligning laser pulses, one may control the average deflection angle and its distribution, induce spectacular rainbow-like features in the distribution of the scattering angle, and reduce substantially the angular dispersion of the deflected molecules. This opens new ways for many applications involving molecular focusing, guiding and trapping by optical and static fields. We present both classical and fully quantum description of the new control scheme, and demonstrate its feasibility with the currently available laser technology.

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