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Control of Molecular Rotation with a Chiral Pulse Train CASEY BLOOMQUIST, SERGEY ZHDANOVICH, ALEXANDER MILNER, JOHN HEPBURN, VALERY MILNER, University of British Columbia — Trains of ultrashort laser pulses separated by the time of rotational revival (typically, tens of picoseconds) have been exploited for creating ensembles of aligned molecules. In this work we introduce a chiral pulse train – a sequence of linearly polarized pulses with the polarization direction rotating from pulse to pulse by a controllable angle. The chirality of such a train, expressed through the period and direction of its polarization rotation, is used as a new control parameter for achieving selectivity and directionality of laser-induced rotational excitation. The method employs chiral trains with a large number of pulses separated on the time scale much shorter than the rotational revival (a few hundred femtoseconds), enabling the use of conventional pulse shapers.

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