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Manipulating the torsion of molecules by strong laser pulses
CHRISTIAN BRUUN MADSEN, LARS BOJER MADSEN, Lundbeck Foundation Theoretical Center for Quantum System Research, Department of Physics and Astronomy, University of Aarhus, 8000 Aarhus C, Denmark, SIMON STENFELDT VIFTRUP, MIKAEL PETER JOHANSSON, THOMAS BJØRNSKOV POULSEN, LOTTE HOLMEGAARD, VINOD KUMARAPPAN, KARL ANKER JØRGENSEN, Department of Chemistry, University of Aarhus, 8000 Aarhus C, Denmark, HENRIK STAPELFELDT, Department of Chemistry and Interdisciplinary Nanoscience Center (iNANO), University of Aarhus, 8000 Aarhus C, Denmark — The manipulation of molecules by strong laser pulses has attracted much attention. Specifically, non-resonant laser fields apply torques on molecules, due to the interaction between the induced dipole moment and the laser field itself. This induced polarizability interaction has proven very useful for controlling the alignment of molecules with respect to the laser polarization. I will present the first efforts made to extend the methods of alignment to manipulating the torsion in a molecule. I will consider the laser induced dynamics of the two phenyl rings of a biphenyl molecule. The present work demonstrates that strong-field laser physics methods and time-resolved measurements are not limited to small linear molecules, but can actually be useful for studying exciting fundamental phenomena in larger complex systems. I will show both experimental and theoretical results.

Christian Bruun Madsen
Lundbeck Foundation Theoretical Center for Quantum System Research,
Dept of Physics and Astronomy, University of Aarhus, 8000 Aarhus C, Denmark

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