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Time-resolved observation of molecular torsional dynamics C.B. MADSEN, J R Macdonald Laboratory, Kansas State University, Manhattan, KS, 66506-2604, USA, J.L. HANSEN, Department of Chemistry, University of Aarhus, Aarhus, DK-8000 Aarhus C, Denmark, L.B. MADSEN, Department of Physics and Astronomy, Aarhus University, DK-8000 Aarhus C, Denmark, H. STAPELFELDT, Department of Chemistry, University of Aarhus, Aarhus, DK-8000 Aarhus C, Denmark — We recently presented the first efforts made to extend the methods of alignment to manipulating and observing the torsion in a molecule [1,2]. Experimental and theoretical results obtained through the joint effort of four Aarhus groups from experimental strong-field laser physics, theoretical physics, theoretical quantum chemistry, and organic synthetic chemistry, demonstrated 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. Lately, we have explored the torsional dynamics on long time scales (ps). These studies revealed the decay of the torsional oscillation in time. Theoretical efforts are made to explore how energy dissipates from the torsional degree of freedom into overall rotation of the molecule.

[1] C. B. Madsen *et al.*, Phys. Rev. Lett. **102**, 073007 (2009).
[2] C. B. Madsen *et al.*, J. Chem. Phys. **130**, 234310 (2009).

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