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Toward molecular switches and biochemical detectors employing adaptive femtosecond-scale laser pulses[1] ROLAND ALLEN, PETRA SAUER, Texas A&M University — The following topics will be discussed: (1) Photoisomerization of azobenzene, with nuclear motion allowing extra electronic transitions for pulse durations ¿ about 50 fs. (2) Photoinduced ring-opening in a model dithienylethene. (3) Response of dipicolinic acid to femtosecond-scale laser pulses, including excited states and nuclear motion. Although real applications (such as molecular switches and biochemical detectors) will involve adaptive techniques – with femtosecond-scale laser pulses whose durations, photon energies, fluences, shapes, etc. are tailored for specific applications – as well as larger systems, one needs an understanding of the rich interplay of electronic and nuclear dynamics to guide more empirical approaches. This understanding can be obtained through detailed computational studies of the kind reported here.

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