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Observing ultrafast dynamics in gas-phase biomolecules¹ SU-SANNE ULLRICH, N.L. EVANS, WILLIAM M. POTTER, University of Georgia — The UV photostability of biomolecules is determined by their excited state electronic relaxation mechanisms. To be effective, these mechanisms must operate on ultrafast timescales in order to dominate over competing photochemical processes that potentially lead to destruction of the biomolecule. Femtosecond time-resolved photoelectron spectroscopy (TRPES) provides unique capabilities for studying photoinduced processes in small polyatomic molecules. Changes in the PES, observed as the delay between the pump and probe pulses is scanned, can be associated with electronic configurational changes during the relaxation process. Analysis based on ionization correlations allows us to extract the electronic character of the excited states in addition to their lifetimes. TRPES has successfully been applied to the study of small biomolecular building blocks, such as the DNA base Adenine, however many challenges are faced when the interest in slightly larger biomolecular subunits, e.g. Adenosine. In this talk I will provide details on our newly constructed photoelectron photoion spectrometer and discuss problems associated with evaporation of larger biomolecules.

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