XUV LASER PHOTOIONIZATION SPECTROSCOPY AT A RESOLUTION OF 0.008 CM^{-1}

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A new broadly tunable (7-17 eV) narrow bandwidth (0.008 cm^{-1}) VUV laser system is presented. The system has been used to record photoionization spectra of small molecules (N_2, CO) in the vicinity of their ionization threshold. At the high resolution detailed information can be extracted on the spectroscopic and dynamic properties of electronically excited states, in particular Rydberg states.