

A HIGH-RESOLUTION VUV SPECTROMETER WITH  
ELECTRONIC PARALLEL SPECTRAL DETECTION

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We demonstrate a new high resolution grazing incidence spectrometer system for spectroscopic applications in the range 50 to 400 Å. The instrument is comprised of a laser-plasma VUV continuum source, a 1.5 m grazing incidence spectrometer, and a 1024-channel VUV optical multichannel analyzer (VUV-OMA). The VUV-OMA is of new design, featuring a special resolution-enhanced channel electron multiplier array in an overall configuration chosen to optimize the spatial resolution of the detector while maintaining single-photoelectron sensitivity. The instrument has the capability of bringing the advantages of linear response and parallel spectral detection to general VUV photoabsorption studies of atoms, ions, molecules, and thin solid samples, as well as studies involving laboratory plasmas. The instrument has the additional special capability of performing time resolved absorption spectroscopy of transient species. The characteristics of the source and detector, along with various applications of the instrument to atomic physics will be discussed.