Spectroscopy of Trapped Ions with a Microcalorimeter on the NIST Electron Beam Ion Trap

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We report on progress in X-ray spectroscopy of trapped ions on the NIST EBIT. Our initial experiments have concentrated on the astrophysically important spectrum of Fe XVII (Laming *et al.,* 2000). We demonstrated that the atomic physics theory for the intensity ratio between two groups of strong lines at ~ 15 Å and ~ 17 Å was essentially correct, and inconsistent with solar and stellar observations. More recently it has been shown that the inclusion in theoretical models of dielectronic recombination from Fe XVIII (Doron & Behar 2002; this is a process not present in the EBIT experiments) can account for this discrepancy.

Further experiments with a dedicated multi-channel microcalorimeter with relatively high throughput will allow investigation of weaker spectral features within a reasonable data acquisition time. Absolute measurements will be made of line intensities relevant to X-ray observations of solar/stellar coronae, supernova remnants, comets, and also to *in situ* particle measurements in the solar wind.

References:

Laming, J. M. *et al.,* 2000, *ApJ*, **545**, L161
Doron, R., & Behar, E. 2002, preprint

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