Charge exchange measurements with an x-ray calorimeter at an EBIT

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Abstract. We present X-ray spectra recorded with the EBIT Calorimeter Spectrometer (ECS) following charge exchange reactions with highly charged ions produced and trapped with the electron beam ion trap EBIT I at LLNL. We have shown that, contrary to previous EBIT measurements of charge exchange spectra [1], significant variations in spectral hardness ratio can be produced by varying the ion species and neutral target gas [2]. We present new measurements that demonstrate further variation in hardness ratio for different ion and neutral species. Our new measurements also exclude the alternative possibility that variations in ion temperature can explain the observed variations in hardness ratio, thus confirming our previous results. We also report on efforts to develop atomic hydrogen injection for EBIT charge exchange experiments.

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