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6.30 The LLNL warm electron beam ion trap (WEBIT): An instrument for calibrating space-borne X-ray spectrometers

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The warm electron beam ion trap (WEBIT) is being developed as a calibration source for space-borne, high-throughput, high-resolution X-ray spectrometers, such as the X-ray Astrophysics Recovery Mission (XARM) Resolve quantum calorimeter. Historically, calibration sources for calorimeter spectrometers have relied on characteristic line emission from x-ray tubes, fluorescing metals, and radioactive sources. The WEBIT, in contrast, relies on emission from x-ray transitions in hydrogenic and helium-like ions whose energies are well known and whose line shapes are relatively simple. The WEBIT can create astrophyscially relevant ions whose x-ray emission falls in the 0.3 to 12 keV science bandpass of Resolve and has a portable design advantageous for a calibration source. The WEBIT will be used to calibrate Resolve's instrumental line shape and gain scale as a function of various operational parameters during both detector subsystem level and instrumental level testing. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Primary author(s) : LOCKARD, T.E. (Lawrence Livermore National Laboratory)

Co-author(s) : MAGEE, E.W. (Lawrence Livermore National Laboratory); BROWN, G.V. (Lawrence Livermore National Laboratory); HELL, N. (Lawrence Livermore National Laboratory); LEUTENEGGER, M.A. (Goddard Space Flight Center-NASA); ECKART, M. E. (Goddard Space Flight Center-NASA); BEIERSDORFER, P. (Lawrence Livermore National Laboratory)

Presenter(s) : LOCKARD, T.E. (Lawrence Livermore National Laboratory); MAGEE, E.W. (Lawrence Livermore National Laboratory); BROWN, G.V. (Lawrence Livermore National Laboratory); HELL, N. (Lawrence Livermore National Laboratory); LEUTENEGGER, M.A. (Goddard Space Flight Center-NASA); ECKART, M. E. (Goddard Space Flight Center-NASA); BEIERSDORFER, P. (Lawrence Livermore National Laboratory)

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