New Capabilities for X-ray Transition Energy and Relative Intensity Determinations using TES Microcalorimeter Detectors

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Abstract. The x-ray microcalorimeter detector using a transition-edge sensor (TES) is a versatile detector that covers a broad energy range and possesses a demonstrated energy resolution of $E/\Delta E \approx 2000$. It operates on the principle of measuring the temperature change due to absorption of single x-ray photons. This type of detector is capable of determining relative intensities of x-ray lines as well as transition energies over an energy range far greater than diffractive studies. The detectors will permit combined measurements of K, L, and M x-ray lines in single spectra. TES detectors covering various energy ranges and resolutions are currently being developed at NIST.