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TES calorimeters and their optimization for a variety of measurements

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I will review some of the main sensor physics issues associated with transition-edge sensor (TES) microcalorimeters and their design. While some of these sensor physics issues will be common to a number of applications, I will focus on those associated with X-ray microcalorimeter TESs. I will describe some the key processes that take place following the absorption of a photon, and some of the most important aspects of design that are important to achieving the best possible energy resolution, and also meeting other detector requirements such as count-rate capability, energy range, pixel size, and array size for a given temperature of operation. Until recently, the physics of the superconducting transition observed in most TESs has been poorly understood. Recent research has shed new, but as yet incomplete understanding of the physics that affect key properties of the TESs. I will discuss some of the implications of these findings and their optimization for a variety of measurements using a variety of different TES calorimeter geomtries.

It has been explained that some additional advice regarding the content of this talk will be provided at the beginning of June. Once received, I intend to update this abstract.