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Abstract 2:

Implications of weak link effects on thermal characteristics of transition-edge sensors

Weak link behavior in transition-edge sensor (TES) devices creates the need for a more careful characterization of a device's thermal characteristics through its transition. This is particularly true for small TESs where a small change in the measurement current results in large changes in temperature. A highly current-dependent transition shape makes accurate thermal characterization of the TES parameters through the transition challenging. To accurately interpret measurements, especially complex impedance, it is crucial to know the temperature-dependent thermal conductance, $G(T)$, and heat capacity, $C(T)$, at each point through the transition. We will present data illustrating these effects and discuss how we overcome the challenges that are present in accurately determining G and T from IV curves. We will also show how these weak link effects vary with TES size.