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Comparison of transition properties among Mo/Au TES microcalorimeters with varied positioning of normal-metal features and bias leads

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We are developing arrays of transition-edge-sensor (TES) microcalorimeters for x-ray astrophysics that will enable high-resolution imaging spectroscopy with energy resolution of <3 eV (FWHM) in the 0.1-10 keV waveband. Our standard device design uses a 140x140 micron^2 Mo/Au bilayer TES (Tc~0.1K) with added normal-metal features for noise mitigation. The TES sits on a SiN membrane and is coupled to an overhanging absorber made of Au or Au/Bi; the absorber contacts the TES/membrane

in a T-shaped contact region. We present a detailed comparison of transition properties among such devices with variations in the relative orientation of the normal-metal features, absorber contact region, and the superconducting bias lead routing near the TES. For example, we show that for a fixed bias lead configuration the magnetic field dependence of the transition properties significantly changes depending on which side of the TES the T-shaped contact region exits onto the membrane perpendicular to the current flow.