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Title:Distributed TES model for designing low noise bolometers approaching SAFARI instrument requirements

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Abstract:Transition edge sensors (TES) are the chosen detector technology for the SAFARI imaging spectrometer on the SPICA telescope. The TES are required to have an NEP of $2\text{--}3 \times 10^{-19}$ W/Hz to take full advantage of the cooled mirror. SRON has developed TiAu TES bolometers for the short wavelength band (30-60 μm). The TES are on SiN membranes, in which long and narrow legs act as thermal links between the TES and the bath. We present a distributed model that accounts for the heat conductance and the heat capacity in the long legs that provides a guideline for designing low noise detectors. We report our latest results that include a measured dark NEP of 4.2×10^{-19} W/Hz and a saturation power of about 10 fW. \copyright ; Springer Science+Business Media, LLC 2012.

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