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Superconducting Hot-Electron THz Photon Counter[1] BORIS KARASIK, Jet Propulsion Laboratory/Caltech, ANDREI SERGEEV, SUNY at Buffalo — We present a concept for the hot-electron transition-edge sensor capable of counting THz photons. The main application for such a sensor is a moderate resolution spectrometer on the Single-Aperture Far-Infrared Observatory with a background-limited NEP $\sim 10^{-20}$ W/Hz$^{1/2}$ expected above 1 THz. Under these conditions, the rate of photon arrival is so low that the photon counting mode will be required. The hot-electron photon counter based on a submicron-size Ti bridge has a very low heat capacity which provides a high energy resolution (170 GHz) at 0.3 K. With the sensor time constant of a few microseconds, the dynamic range would be $\sim$ 30 dB that should be sufficient for most of applications. The sensor couples to radiation via a planar antenna and is read by a SQUID amplifier. A compact array of the antenna-coupled counters can be fabricated on a silicon wafer without membranes. The presentation will describe the concept and the first experimental results.

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