

Contributed Talk

**High Energy Resolution TES at Telecom Wavelength**

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The intrinsic capability to measure the energy of the absorbed photons and the possibility to resolve the number of incident photons distinguishes single photon detectors from photon number resolving (PNR) devices. The intrinsic energy resolution is one of the most important figure of merit for such detectors. Transition Edge Sensors (TESs) are among the well-performing PNR detectors today available. They are fundamental for quantum metrology experiments and in general for quantum technologies. By exploiting titanium gold based TES, the single photon energy at telecom wavelength (1570 nm - 0.79 eV) is detected with an energy resolution of  $\Delta E = 0.113$  eV. An analysis of the main contributions of  $\Delta E$  leads to an overall standard relative uncertainties of 0.9%. Up to five discriminated photons with uncertainty of the photon state assignment less than 1% and a device absolute efficiency of 30% are shown.