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Progress in the optimal TES pixel design for the X-IFU Frequency Division Multiplexing read-out

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Frequency-Division Multiplexing (FDM) is the baseline readout system for the large array of superconducting Transition-Edge Sensors (TES's) under development for the ESA X-IFU instrument on the future Athena X-ray telescope.
Excellent single pixel performance has been demonstrated already with MHz biased MoAu NASA-Goddard TESs and energy resolution below 2eV @ 6keV is routinely observed, in single pixel mode, with the FDM read-out developed at SRON/VTT.
Non-uniformity in the superconducting transition, due to the Josephson effects in a MHz-driven TES, has been observed and is potentially affecting the performance of a large array readout with a large multiplexing factor.
We are currently testing, under ac bias, several detector arrays fabricated at NASA-Goddard using MoAu-based TESs and at SRON using TiAu bilayers.
In this paper, we will present the results of an extensive experimental characterization of many pixels with various design and electro-thermal properties.

Less than 5 years of experience since completion of Ph.D

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Student (Ph.D., M.Sc. or B.Sc.)

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