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Development of Transition-Edge Sensor X-ray Microcalorimeter Linear Array for High Energy Applications

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We are currently building a transition-edge sensor (TES) X-ray spectrometer for the Advanced Photon Source at Argonne National Laboratory for energies less than 20 keV in collaboration with National Institute of Standards and Technology (NIST). The spectrometer consists of application specific TES sensors for pilot X-ray emission spectroscopy (XES) and X-ray absorption fine structure (XAFS) experiments. We propose to develop and fabricate TES sensors for the very hard X-ray energy range (20-100 keV). We have recently published an article where we present a design optimization for a linear TES array for energy-dispersive X-ray diffraction (EDXRD) and Compton scattering measurements [1]. We present our progress on simulation results, preliminary sensor layouts, and proof-of-principle fabrication of millimeter long SiN membranes.

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[1] D. Yan et al; Modelling a Transition-Edge Sensor X-ray Microcalorimeter Linear Array for Compton Profile Measurements and Energy Dispersive Diffraction, arXiv:1902.10047 (2019).

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

N

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

N

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