

Fabrication of X-ray Micro Calorimeters using Ti/Au Bilayer Transition Edge Sensors

Y. H. Lee ^a, Y. D. Kwon ^a, S. J. Lee ^b, H. Y. Lee ^a, K. B. Lee ^a, M. K. Lee ^a,
Y. H. Kim ^a

^a *Korea Institute of Standards and Science, Daejeon, Korea*

^b *Seoul University, Seoul, Korea*

Transition edge sensors (TES) were fabricated by bulk micro machining technique. The Au/Ti bilayer TES was formed on a SiN_x membrane with lithographic and e-beam evaporation method. In case of a Ti-20 nm/Au-100 nm TES with a 1 μm Au absorber, energy resolution about 45 eV was obtained at transition temperature of 155 mK. Moreover additional Au bank structure was applied to the bilayer sensing part, and the corresponding change in the physical properties was studied. The transition temperature of the new TES showed stable value of 85 mK under same conditions. The energy resolution of new TES was represented about 35 eV. Here, we present details of fabrication processes and performances of these devices.

Keywords: transition edge sensor (TES), x-ray, micro machining