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**Pixelated parallel-plate avalanche counter for the  $\gamma$ -ray energy tracking arrays** C.Y. WU, LLNL, D. CLINE, A.B. HAYES, U. Rochester, I.Y. LEE, LBNL — We plan to improve the CHICO position resolution to match that of GRETINA by adopting the pixelated boards with spherical coordinate  $\theta$  and  $\phi$  sensing. This allows very fine corrections of the Doppler shift of observed  $\gamma$  rays and achieving the  $\gamma$ -ray energy resolution to nearly the intrinsic resolution of Ge detector. An eight-layer pixelated board was designed and successfully fabricated. The board has a total of 961 pixels and each one has a dimension of 1.6 x 1.6 mm with a gap of 0.4 mm between them. The position is not determined by the individual pixel instead by taking the time difference between both ends of delay lines, where connections are made by interconnecting pixels with a checker-board pattern. The initial tests have demonstrated the feasibility of this technique that a highly uniform and linear-dependent position spectrum with a resolution better than 2 mm is achieved. Additional tests are in the planning stage to address issues related to the pulse height dependence with respect to the lateral distance and pixel size. We will report the results of the latest tests and discuss the science opportunities related to this upgrade. This work is supported by DOE, LLNL Contract DE-AC52-07NA27344 and LBNL Contract DE-AC02-05CH11231 as well as the NSF.

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