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Evaluating a new segmented germanium detector contact technology E.G. JACKSON, C.J. LISTER, P. CHOWDHURY, University of Massachusetts Lowell, E. HULL, R. PEHL, PHDs Co — New technologies for making gamma ray detectors position sensitive have many applications in space science, medical imaging, homeland security, and in nuclear structure research. One promising approach uses high-purity germanium wafers with the planar surfaces segmented into orthogonal strip patterns forming a Double-Sided Strip Detector (DSSD). The combination of data from adjoining strips, or pixels, is physics-rich for Compton image formation and polarization studies. However, sensitivity to charge loss and various kinds of cross-talk [1] have limited the usefulness of first generation devices. We are investigating new contact technologies, developed by PhDs Co [2], based on amorphous-germanium and yttrium contacts RF sputter deposited to a thickness of $\sim$ 1000 Å. New techniques allow both physical and photolithographic segmentation of the contacts with inter-strip gap widths of 0.25 mm. These modifications should improve all aspects of charge collection. The new detector technology employs the same material and fabrication technique for both the n- and p- contacts, thus removing artificial asymmetry in the data. Results from tests of cross-talk, charge collection, and scattering asymmetry will be presented and compared with older technologies. This mechanically cooled counter, NP-7, seems to represent a breakthrough.

[1] S. Gros *et al.*, Nucl. Inst. Meth. A 602, 467 (2009).
[2] E. Hull *et al* Nucl Inst Meth A 626, 39 (2011)

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