

Abstract Submitted  
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**The impact of neutral impurity concentration on charge drift mobility**<sup>1</sup> HAO MEI, GUOJIAN WANG, DONGMING MEI, GANG YANG, YU-TONG GUAN, Univ of South Dakota — High-purity germanium crystals are being grown using the Czochralski technique at the University of South Dakota. The carrier concentration, mobility and resistivity are measured by Hall Effect system. Many factors contribute to the overall mobility. We investigated the impact of neutral impurity concentration on charge drift mobility. Several samples with measured mobility larger than  $35000 \text{ cm}^2/\text{Vs}$  from the grown crystals were used for this investigation. With the measured mobility and the ionized impurity concentration, we were able to calculate the neutral impurity concentration by the Matthiessen's rule. The correlations between the neutral impurity concentrations with the radius of the crystals were studied. We report that the concentration of neutral impurity constrains charge draft mobility for high-purity germanium crystals and the non-uniform distribution of neutral impurity could result in an anisotropy of draft time distribution in a given germanium detector.

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