Abstract Submitted
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Investigation of charge trapping at grain boundaries in polycrystalline and multi-crystalline silicon solar cells[1] JENNIFER HEATH, Linfield College, CHUN-SHENG JIANG, HELIO MOUTINHO, MOWAFAK AL-JASSIM, National Renewable Energy Laboratory — The electronic properties of grain boundaries in polycrystalline and multicrystalline silicon are known to vary significantly depending on the individual grain misorientations, due to differences in dangling bonds, strain, and impurity gettering. By correlating Electron Backscattering Diffraction maps with the Light Beam Induced Current data, we can see, as expected, that the minority carrier diffusion length is significantly reduced near certain grain boundaries (GB) while others are relatively benign. We have found that GBs with poor diffusion length also tend to have trapped charge, resulting in depletion regions along the GB visible in Scanning Capacitance Microscopy (SCM) data. Scans of SCM signal as a function of dc probe voltage and temperature allow these regions to be more quantitatively investigated.

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Jennifer Heath
Linfield College

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