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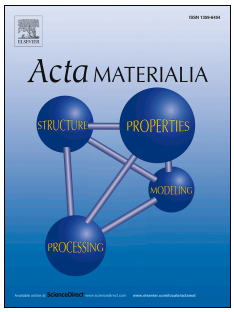

Integrated imaging in three dimensions: Providing a new lens on grain boundaries, particles, and their correlations in polycrystalline silicon

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Graphical Abstract

A cross-correlative imaging platform combining laboratory-based diffraction contrast tomography (LabDCT) and attenuation contrast tomography (ACT) was developed in order to measure in 3D the characteristics and distributions of second-phase particles and grain boundaries in polycrystalline silicon. We find that there is a non-uniform particle cloud in our samples, due to precipitation along coincident site lattice (CSL) boundaries. Through the experimental and computational workflows introduced in our work, we demonstrate that multimodal X-ray imaging can be used as a diagnostic tool for improving the quality of technological materials, e.g., solar cell components.