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Optical Absorption Mechanisms in Sulfur Hyper-doped Silicon JOSEPH SULLIVAN, Department of Mechanical Engineering, Massachusetts Institute of Technology, DANIEL RECHT, Harvard School of Engineering and Applied Sciences, CHRISTIE SIMMONS, Department of Mechanical Engineering, Massachusetts Institute of Technology, MICHAEL AZIZ, Harvard School of Engineering and Applied Sciences, TONIO BUONASSISI, Department of Mechanical Engineering, Massachusetts Institute of Technology — Silicon that is doped with sulfur, a deep-level donor, to concentrations approaching 1% at. demonstrates sub-band gap optical absorption, and has potential applications as an intermediate band solar cell material and a short-wavelength infrared (SWIR) photodetector. Understanding the nature of the absorption mechanism will aid in creating future devices with this exciting material. To elucidate the absorption mechanism, the reflectivity and absorption coefficient have been measured to photon energies down to 75 meV. We report on these new measurements as well as data fitting that give insight into absorption mechanism within these materials.

- Prefer Oral Session
 Prefer Poster Session

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