Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Infrared spectroscopy of high purity Si for application in astronomy BERIK UZAKBAIULY, JIAN GE, DAVID TANNER, University of Florida — High resolution infrared (IR) spectroscopy is an essential tool in astronomical studies and Silicon Immersion Gratings (SIGs) offer 3.4 times gain in spectral resolution over conventional echelle gratings of the same length and blaze angle. SIGs have Si as the host material, relying on its high transparency in much of the infrared region. Si is transparent below the multiphonon absorption for far-infrared ($\sim$20-300 microns) use as well as in the near infrared ($\sim$1-6 microns). We have measured high-purity silicon transmittance from far to near infrared. Narrow lines, due to residual impurities and with interesting temperature dependences, appear in the far IR region. We present the transmittance of high purity bulk Si from the band edge (9000 cm^{-1}) to far infrared (20 cm^{-1}) using FT-IR spectrometer and modified Perkin Elmer grating spectrometer. Impurities have been identified and their temperature dependence will be discussed.

Berik Uzakbaiuly
University of Florida

Date submitted: 03 Dec 2012 Electronic form version 1.4