

WISE-Reprocessed: Infrared Images of the Solar System

Abstract- The Wide-field Infrared Survey Explorer data is a highly sensitive all sky survey that mapped the sky at infrared wavelengths with as much as 500 times the sensitivity of its predecessor. The orbit and post image processing was designed to preserve distant objects and therefore caused a blurring of any nearby spatial structures (within the solar system). One type of nearby spatial structures are the zodiacal dust bands. My work attempts to reprocess the data in a way that preserves the signal from extended emission structures in the zodiacal cloud.



Background:

- The zodiacal cloud is a debris cloud composed of dust resulting from comets and asteroids in the solar system
- The micron sized particles are visible in the infrared spectrum
- WISE Scanned in four different wave bands pictured below

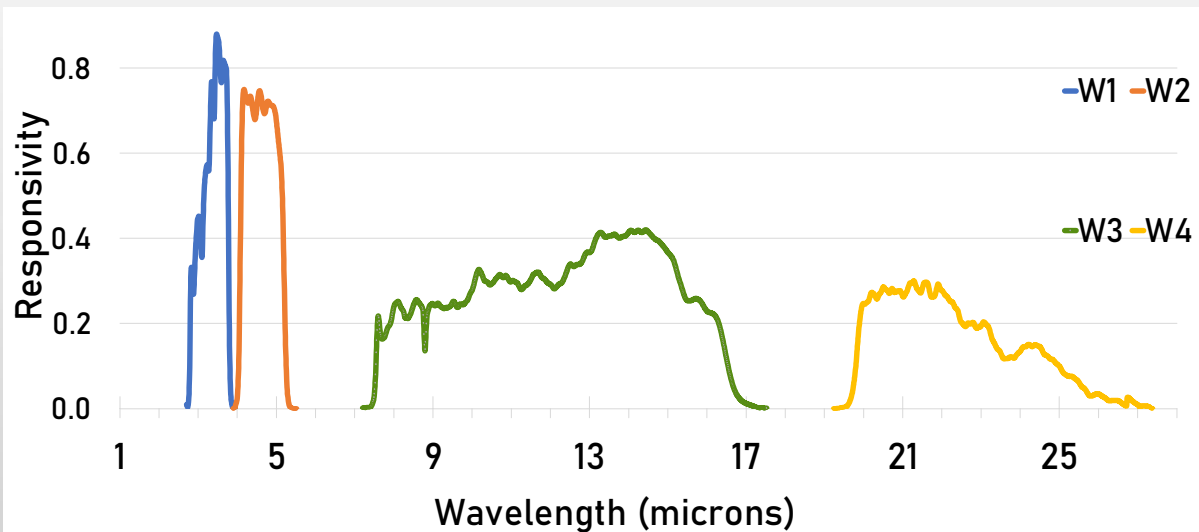
Motivation:

- The zodiacal dust cloud interferes with infrared imaging of items outside the solar system
- Known asteroid collisions could be dated to an approximate range by studying the dispersion of dust at a certain inclination

My Work:

- Working with the ERAU Vega Super Computing cluster to coadd large batches of WISE data
- Gaining experience with parallel computing
- Learning to work as an independent professional researcher in a team setting

Example Pole to Pole Intensity Scan of the Zodiacal Dust Cloud (From IRAS Data)



WISE Imager Responsivity Per Photon

