PINPOINTING MAIN-BELT SOURCE REGIONS FOR METEORITE CLASSES. C. A. Thomas[1] and R. P. Binzel[1], [1]Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA 02139, cathomas@mit.edu.

Introduction: Near-Earth objects (NEOs) represent the large size distribution of material delivered from the main asteroid belt to the vicinity of the Earth. Smaller members of this main-belt to near-Earth flux are sampled relatively frequently as meteorites. Linking meteorites to observable near-Earth objects and in turn dynamically linking near-Earth objects to their main belt sources provides a traceable path for pinpointing the chemical and formation conditions in the early solar system.

Study Method: Previous work has been done to link meteorites to NEOs and then link the NEOs to their most likely source regions. In order to forge the connection between meteorites and NEOs, we use a three dimensional method for quantitative comparisons between laboratory measurements of meteorites and telescopic measurements of near-Earth objects (NEOs). We utilize meteorite spectra available from the Reflectance Experiment Laboratory database (http://www.planetary.brown.edu/relab) and NEO data from the SpeX instrument on the NASA IRTF [1]. Using the Modified Gaussian Model (MGM) [2] as a mathematical tool (with no mineralogy interpretation), we treat asteroid and meteorite spectra identically in the calculation of 1-micron and 2-micron geometric band centers and their band area ratios (BARs). Using these numerical data we examined the differences of the H, L, LL and HED meteorite classes. For each NEO spectrum, we assigned a set of probabilities for it being related to each of these classes, yielding probability distributions for our NEO data set being related to H, L, LL, and HED meteorites. Our meteorite correlation distribution was then convolved with an NEO source region model [3] to shed light on connections between these meteorite classes and their asteroid belt origins.

Using results from this model we are able to investigate additional signals in the data set. We will also explore the effects of temperature corrections and error calculations on the model results.

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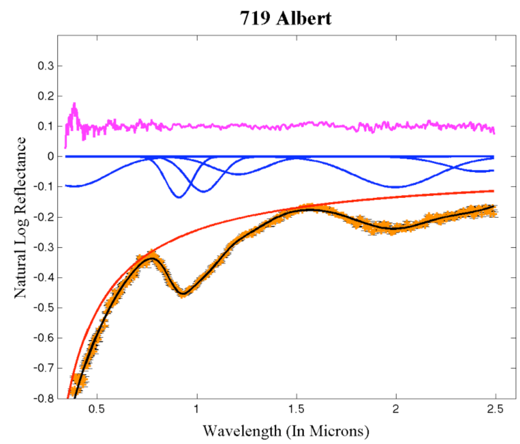

Figure 1: Example of MGM fit to data for near-Earth object (719) Albert.

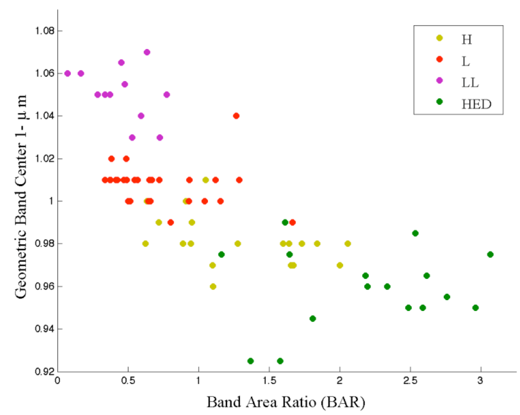

Figure 2: The 1-micron Geometric Band Center plotted versus Band Area Ratio (BAR) for the entire meteorite sample.

References: [1] Rayner, J. T. et al. (2003) *PASP* **115**, 362. [2] Sunshine et al. (1993) *JGR* **98**, 9075. et al. (1997) [3] Bottke et al. (2002) *Icarus* **156**, 399.