Spectroscopic Study of the D-type(?) Tirela Family T. Mothé-Diniz[1] and D. Nesvorný[2], [1]Observatório Nacional – Rua Gal. José Cristino, 77; 20771-001 Rio de Janeiro/Brasil – thais.mothe@on.br, [2]SWRI, .1050 Walnut St., Suite 400, Boulder, Colorado 80302 - davidn@boulder.swri.edu

Asteroid families are groups of asteroid fragments with similar orbits and spectra that represent remnants of large, collisionally disrupted asteroids. They are useful targets for spectroscopic studies because different fragments of a single asteroid family sample different parts of the disrupted parent body. By spectroscopically characterizing different fragments we may learn about the composition of the parent body.

In observing the Tirela family, we tried to spectroscopically characterize the only known family in the main belt whose biggest fragment was classified as a D-type in the literature. This suggested that we could have found the first D-type family in the Main-Belt. The original orbit of the parent body of the Tirela family has high eccentricity and inclination ($e = 0.20$ and $i= 16.8$ deg) and is located at the edge of the outer asteroid belt ($a=3.12$ AU). While other families have been extensively studied (like Eos,Flora, Themis, Eunomia, among others) very little spectroscopic information existed until now about the Tirela family. Before this study, the only information available about Tirela family was from SDSS data. Its members have colors (obtained from the Sloan Digital Sky Survey, SDSS) that suggested steep spectral slope similar to 1400 Tirela. Although the SDSS data is useful to get basic insights, the understanding of mineralogy of these objects can be obtained only via identifying small spectroscopic features (absorption bands) that cannot be detected in SDSS colors.

To fulfill our objectives, we tried to observe the faint family members from many telescopes. We obtained spectra of 11 of them at GEMINI North and South and TNG (visible) and the spectrum of 1400 Tirela in the NIR at IRTF Telescope. In this presentation I will show the results of this study, which seem to indicate that actually, Tirela family may not be a primitive D-type family, as expected. Some of its members do have a 1-micron band in its spectrum, which implies the presence of Olivine and/or Pyroxene at their surfaces. This result has important implications for our understanding of the mineralogical variety of the asteroid belt.