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Difference in Degree of Space Weathering on Newborn Asteroid Karin

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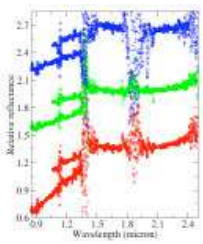
Here we report a near-infrared spectroscopy of 832 Karin, the brightest asteroid among the Karin cluster group, which is thought to be the remnants of a collisional breakup only 5.8 million years ago. The spectroscopic observation was performed by the Subaru telescope on 2003 September 14 at rotational phases of 0.30-0.34 (first), 0.35-0.38 (second), and 0.40-0.50 (last); for details refer to Sasaki *et al.*, 2004.

For different rotational phases of Karin, we derived different spectra such as reddened spectrum (red; first) and unreddened spectra (green; second, blue; last) (Fig.1). In Fig.1, spectra at zJ and JH bands are separated for clarity. The first set seems to be reddened from the second or last set by space weathering. Figure 2 shows that the first set's spectrum of Karin (red) matches the spectrum of the S(VI) class asteroid 584 Semiramis (cyan triangle), and the last set's spectrum (blue) matches the spectrum of L6 ordinary chondrite Paranaiba (magenta square). Our results support the idea that S-type asteroids are parent bodies of ordinary chondrites.

Keywords: Spectroscopic observation, Asteroids, Space weathering



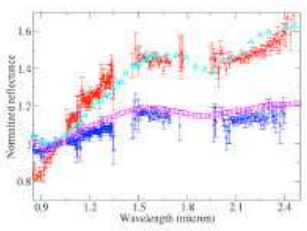


Figure 1: Relative spectra vertically shifted. Figure 2. Reflectance spectra normalized at 1.0 μm.

References

[1] T. Sasaki *et al.*, *APJ*, 615, L1611 (2004).
[2] D. Nesvorny *et al.*, *Nature*, 417, 720 (2002).