

The appearance of a non-weathered 'fresh' surface on 596 Scheila after the impact event

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596 Scheila was discovered to have a comet-like appearance on 2010 December. It is thought that the comet-like activity was caused by a few tens of meters in diameter impacting its surface and scattering the ejecta. While the asteroid surface is subjected to the process of space weathering, the ejecta from craters are ejected and scattered on the surface of the asteroid from underground where they are not affected by space weathering. This means that the 596 surface has been refreshed by this activity. We (Hasegawa et al. 2022, ApJL 924, L9) found that there was no change in the visible and 3- μ m spectrum, but the near-infrared spectrum from 0.8 μ m to 2.5 μ m wavelength region changed to red (from T class to D class). This indicates less red due to space weathering process, which is consistent with the results of laboratory experiments on the Tagish lake meteorite, which has a similar spectrum to 596. This discovery is the first example of astronomical observations confirming the space weathering process of Tagish lake like bodies.