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# Spectral analysis of Ceres' linear features

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Linear features are commonly found on small bodies and can have a geomorphic or tectonic origin. Generally, these features are studied by means of morphological analyses. Here we propose a spectroscopic analysis of linear features on Ceres by means of the Dawn/VIR imaging spectrometer, in order to search for correlation between their spectral properties and their origin.
Basing on morphological analysis, Scully et al. (2017) found two main types of linear features on Ceres: tectonic grooves (pit chains, fractures) and geomorphic grooves (secondary crater chains). We analyzed them by studying the distribution of the main spectral parameters in their vicinity, i.e. infrared albedo, band depth at 2.7 [U+F06D]m (ascribed to phyllosilicates) and at 3.1 [U+F06D]m (ascribed to ammonium) [De Sanctis et al., 2015]. In particular, we focused on Junina and Gerber Catenae (examples of geomorphic grooves) and Samhain Catenae (an example of a tectonic groove).
In association with the two geomorphic grooves, both the band depths are lower than those of the surroundings, indicating a difference in the abundance of ammoniated phyllosilicates between the impacting material and the underlying surface, or a different grain size. In contrast, Samhain Catenae are generally not associated with spectral discontinuities.
This behavior is similar to what is observed on other asteroids, such as Vesta, Lutetia and Eros (Longobardo et al. 2015), where a change in spectral properties is generally observed on linear features with a geomorphic origin and not in those with a tectonic origin. However, this is a general behavior and exceptions could arise: for example, when the subsurface is exposed in tectonic features or when material moves downslope to fill the feature. Analysis is currently in progress to verify if this behavior also occurs on Ceres.

De Sanctis et al. (2015), Nature 528, 241-244
Longobardo et al. (2015), Icarus 259, 72-90
Scully et al. (2017), GRL, 44, 19, 9564-9572