Composition and structure of the shallow subsurface of Ceres revealed by crater morphology

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Supplementary Information Guide:

This PDF contains supplementary figures.

Figure S1: The distribution of measured craters on Ceres.

Figure S2: Crater size frequency distributions for Vinotonus and Coniraya

Figure S3-S15: Topography data for all craters discussed in the text.
Figure S1: Shaded relief map showing locations (red dots) of the 25 craters included in this study. The shaded relief map was created from stereo-photogrammetry and has a resolution of 135 m/pixel.
Figure S2: Crater size frequency distributions (CSFDs) for the craters Coniraya and Vinotonus determined by two different and independent counters. The two craters are of similar age (error bars of all individual crater bins overlap). Both craters are heavily contaminated by secondaries, making precise CSFD measurements challenging.
Topography data for craters discussed in the text (Figs. S3-S15)
The following figures (Fig. S3-S15) show the image mosaics and DTMs used to measure the depths of crater on Ceres. Only those craters explicitly discussed in the text are included. Each figure is divided into 20 panels. Craters are shown in order of decreasing diameter. Each figure is structured identically as follows. A. Dawn FC image mosaic (140 m/pixel). B. DTM overlaid on image mosaic. The color scale is from -5 km to +5 km in each figure (blue low, red high). Each panel shows a region of Ceres roughly 30° x 30° (lat./lon.). Craters located below 60° latitude are shown in a Lambert azimuthal equal area projection, while craters at higher latitudes are shown in a stereographic projection. C. As in B but with position of profiles drawn. Profiles are drawn in ~22.5° increments and are numbered such that profile 1 is at the 12 o’clock position and profile numbers increase clockwise (e.g., profile 9 is at 6 o’clock). Each profile begins at the crater center. No attempt was made to avoid surrounding craters. D. Combined profiles for the crater. The red curve shows the average profile. Note that because many of the profiles pass through adjacent craters, the red curve underestimates the average (crater free) elevation of the surrounding terrain. The individual topographic profiles are shown in panels 1-16 (numbered as described for panel C). The crater center is on the left side of each profile.
Figure S3: Crater Kerwan. 10.8° N, 123.9° E, $D = 280$ km, $d_a = 5.5$ km (range 3-7 km).
Figure S4: Crater Yalode. 42.5° S, 292.5° E. \(D = 280\) km, \(d_a = 6.5\) km (range 2.5 – 8.5 km).
Figure S5: Crater Urvara. 45.6° S, 249.2° E, $D = 170$ km, $d_o = 7$ km (range 5-9 km).
Figure S6: Crater Vinotonus. 43° N, 95.1° E, $D = 140$ km, $d_o = 5.25$ km (range 4-8 km).
Figure S7: Crater Coniraya. 39.9° N, 65.7° E, $D = 135$ km, $d_a = 500$ m (range 0-3 km).
Figure S8: Crater Zadeni. 70.1° S, 38.8° E, $D = 128$ km, $d_a = 5$ km (range 2-5.5 km).
Figure S9: Crater Dantu. 24.3° N, 138.2° E, D = 126 km, $d_a = 4$ km (range 1.5 – 5 km).
Figure S10: Crater Chaminuka. 58.6° S, 131.2° E, D = 122 km, d_a = 5 km (range 1 – 6 km).
Figure S11: Crater Ezinu. $43.2^\circ$ N, $195.7^\circ$, $D = 116$ km, $d_o = 5.5$ (range 4.5 – 6.5 km).
Figure S12: Crater Kirnis. 4.9° N, 195.7° E, $D = 115$, $d_a = 4$ km (range 0 – 5.5 km).
Figure S13: Unnamed Crater. 18° N, 326° E, D = 103 km, d_a = 2.25 km (range 0 – 5 km).
Figure S14: Crater Occator. 19.8° N, 239.3° E, D = 92 km, d_a = 3 km (range 1.5 – 4.5 km).
Figure S15: Crater Geshtin. $57^\circ$ N, $258.8^\circ$ E, $D = 80$ km, $d_a = 2$ km (range 0.5 – 3 km).