

Fig. 5. Selected topographic profiles across Apolloodorus (aa') and Atget (cc' and dd') craters and a prominent trough (bb') within the Pantheon Fossae graben complex. The interior of Atget marks the lowest point of the DTM.

the elevation of the basin rim by 1 km. A second, more modest high, seen in parts of the southern basin floor, is flanked by lows to the north and south (Fig. 3). The northern of those lows, which trends more or less east–west across the basin center, covers an area at least as large as the southern high. The magnitudes of these long-wavelength undulations in floor height reach 1–1.5 km (see profile bb' in Fig. 3). It is possible that these topographic patterns are artifacts, as discussed below, but first we consider the basin floor topographic model at face value.

Physical mechanisms to account for the long-wavelength undulations in the Caloris basin floor displayed in the DTM are all problematic. One possibility is that the highs are relics of initially high topography in the pre-Caloris target area, perhaps smaller analogs of the extensive high region to the west of the basin (Fig. 1). The prominent Apennine–Archimedes area of the Imbrium basin provides an example of this scenario; the Archi-

medes plateau and the Apennine peaks remained high during later volcanic filling and constitute one of the least flooded areas of the Imbrium interior (Head, 1982). The Caloris interior is pervasively filled by plains material characterized by high reflectance and a steeper than average (or “redder”) slope to the reflectance from visible to near-infrared wavelengths (Murchie et al., 2008; Robinson et al., 2008; Denevi et al., 2009). Sufficiently large younger craters in the basin floor have excavated low-reflectance material with shallower (or “bluer”) spectral slope (Murchie et al., 2008; Denevi et al., 2009), indicating that such low-reflectance material underlies the high-reflectance plains at a depth of several kilometers (Ernst et al., 2010). There is no indication, however, that the thickness of high-reflectance plains is markedly less in areas of high floor topography on the DTM, as would be expected if such areas were also high prior to the time of volcanic infilling.

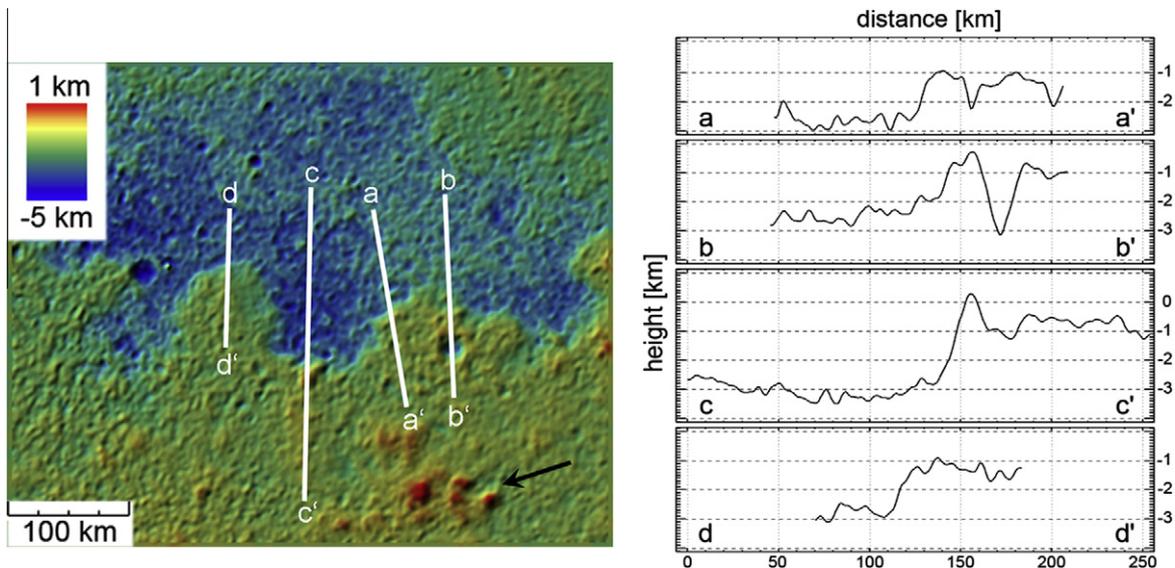


Fig. 6. Selected topographic profiles across the southern rim of the Caloris basin. Note the steep drop in elevation across the rim. The topographic feature marked by the black arrow is identified as part of the outer Caloris rim.