EPSC Abstracts,
Vol. 4, EPSC2009-563, 2009
European Planetary Science Congress,

Isostasy on Iapetus

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Abstract

Iapetus is a medium sized satellite of Saturn. Its shape corresponds to the shape of a uniform body rotating with the period of ~16 hours although its present period of rotation is 79.33 days. This discrepancy is usually explained in terms of the large non-hydrostatic fossil equatorial bulge supported by a thick and rigid lithosphere [1]. This explanation is difficult to reconcile with the present day synchronous rotation of Iapetus, since that requires a high dissipation and low viscosity of the interior in the past. Here we show, basing on the principle of isostasy, that the equatorial bulge could be a result of low density matter (roots) underlying the lithosphere below the equator. The gravitational differentiation cooperating with solid-state global convection is responsible for the origin of the roots [2].

Bibliography

References

[1] Castillo-Rogez, J.C., *et al.*, (2007) *Icarus* **190**, 179-203.

[2] Czechowski, L., Leliwa-Kopystyński, J. (2005) *Planet. Sp. Sci.* **53**, 749-769.