
Large impacts and their contribution on the volatile budget of the Early Moon

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Résumé

The presence of water on the Moon is difficult to reconcile with its origin: a giant impact between the proto-Earth and an impactor larger than Mars. This environment has extreme conditions that should not allow the preservation of volatiles in the protolunar disk. However, recent measurements on the samples carried out with new technologies highlight the presence of a significant amount of water on the Moon. We use a 2D axisymmetric model with the hydrocode iSALE-Dellen to study the fate of a large impactor on a target body similar to the early Moon with a crust, a magma ocean, and a mantle. For this purpose, we compute different models to monitor the depths at which the impacted material is buried at the end of the impact event. Three parameters explored : the crustal thickness ranging from 12 to 100 km, the impactor radius ranging from 25 to 400 km and the impactor velocity ranging between 0.5 and 10 km/s.

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