

Exploring the differential rotation in Jupiter with Juno

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Abstract

A long standing question in planetary science is the depth of Jupiter zonal flows, do these winds penetrate deep into the interior or the planet or not? This information is relevant to get better constrains in the interior structure of Jupiter.

Juno's remarkable gravity measurements [1, 2, 3] is changing the way we see this giant planet and leading to a much better comprehension of Jupiter's atmosphere and interior.

Using this gravity measurements we derive new interior models that include the presence if a dilute core [4] and where we can start to put some constrains on the depth of Jupiter's zonal flows and rotation in the deep interior [5, 6], leading to a much better understanding on Jupiter's deep secrets.

References

[1] Bolton, S., et al.: Jupiter's interior and deep atmosphere: The initial pole-to-pole passes with the Juno spacecraft, *Science*, Vol. 356, pp. 821-825, 2017.

[2] Folkner, W. M. et al.: Jupiter gravity field estimated from the first two Juno orbits, *Geophys. Res. Lett.*, Vol 44, 4694-4700, 2017.

[3] Iess, L. et al.: Measurement of Jupiter's asymmetric gravity field, *Nature*, Vol 555, pp. 220-222, 2018.

[4] Wahl, S. M. et al.: Comparing Jupiter interior structure models to Juno gravity measurements and the role of an expanded core: *Geophys. Res. Lett.*, Vol 44, pp. 4649-4659, 2017.

[5] Guillot, T., Miguel, Y., et al.: A suppression of differential rotation in Jupiter's deep interior, *Nature*, Vol 555, pp. 227-230, 2018.

[6] Kaspi, Y. et al.: Jupiter's atmospheric jet streams extend thousands of kilometres deep, *Nature*, Vol 555, pp. 223-226, 2018.