

Table 1 Measured gravity harmonic coefficients of Saturn (un-normalized; reference radius 60330 km) and total ring mass (in units of Mimas' mass).

The J_l value includes a constant tidal term owing to the average tidal perturbation from the satellites. The associated uncertainties are recommended values to be used for analysis and interpretation. For the zonal harmonics they correspond to 3 times the formal uncertainties. The solution for the total ring mass (A+B+C) is stable independently of the adopted dynamical model (table S2) and the uncertainty reported is the 1σ formal uncertainty. See table S2 for our total ring mass estimates for several models of the unknown accelerations.

	Value	Uncertainty
J_2 ($\times 10^6$)	16290.573	0.028
J_3 ($\times 10^6$)	0.059	0.023
J_4 ($\times 10^6$)	-935.314	0.037
J_5 ($\times 10^6$)	-0.224	0.054
J_6 ($\times 10^6$)	86.340	0.087
J_7 ($\times 10^6$)	0.108	0.122
J_8 ($\times 10^6$)	-14.624	0.205
J_9 ($\times 10^6$)	0.369	0.260
J_{10} ($\times 10^6$)	4.672	0.420
J_{11} ($\times 10^6$)	-0.317	0.458
J_{12} ($\times 10^6$)	-0.997	0.672
Ring mass (M_M)	0.41	0.13