



Static tidal response coefficients k_{nm} for Neptune

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Uranus and Neptune have similar mass, radius, and gravitational field data. Yet, the larger observational uncertainty in the zonal harmonic coefficient J_4 for Neptune allows for a wide range of different interior mass density distributions for Neptune. This poses the question of perhaps dissimilar interiors of the ice giants. Here we show how different interior structure models for Neptune reflect in different fluid Love number k_{nm} values and J_4 - k_{nm} relations. The k_{nm} are assumed to be raised in tidal response to its major moon Triton. We suggest that a measurement of the tidal response and of an accurate determination of J_4 might require an orbiting spacecraft.