Geophysical Research Abstracts
Vol. 14, EGU2012-9664, 2012
EGU General Assembly 2012

Slichter modes of Mercury: period and possible observation

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We study the period of the Slichter mode (vibrational mode of the inner core of a planet) of Mercury in relation to its interior structure and assess the possibility to observe this mode with the probes MESSENGER and BepiColombo. Grinfeld and Wisdom (2005) have developed a methodology for the determination of the period of the polar Slichter modes of a planetary interior consisting of three homogeneous layers. We generalized this approach to models with an arbitrary but finite number of layers. Slichter mode periods are calculated for a large set of interior structure models of Mercury. Periods obtained ranges from a few hours to more than hundred hours depending mainly on the size of the inner core. The Slichter mode of Mercury could be excited to a level observable by BepiColombo by an impact by a meteoroid with a radius of at least 100 m (assuming that the Slichter mode is the only excited mode). However, observation of the Slichter mode of Mercury by BepiColombo would require a fortunate recent impact since the estimated magnetic damping time of the mode is well below the average time between impacts of at least this size.