# Orbital modulation of the geomagnetic field versus rock-magnetic contamination

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Since the late 90s, a possibility on the orbital modulation of the geomagnetic field has been suggested based on the Milankovitch frequencies found in paleointensity records: ?41 kyr obliquity frequency (Channell et al., 1998), and ?100 kyr eccentricity frequency (Yamazaki, 1999; Yokoyama and Yamazaki, 2000; Thouveny et al., 2004;Yamazaki and Oda, 2005). An argument against the orbital modulation of the paleointensity is that it could be an artifact caused by paleoclimatically induced magneticproperty changes of sediments. If variations of magnetic properties of sediments such as magnetic grain size and mineralogy contain the orbital periodicities and show significant coherence with paleointensity changes, this suggests possible contamination of magnetic property changes to paleointensity records (Guyodo et al., 2000). However, this cannot exclude the possibility of orbital modulation of paleointensity, because magnetic properties and paleointensity can also have coherence if the orbital parameters affect both the geomagnetic field and depositional environments. Responses of sediment lithologies to paleoclimatic changes vary place to place, and this would also apply to magnetic properties: for example, magnetic grain size would increase in a certain period of time in some areas, but in other areas it would decrease in the same period of time. We consider that rock-magnetic contamination can be evaluated by detailed comparison of paleointensity records from sediments of various lithologies. It is important to examine phase relationships as well as coherences between paleointensity and magnetic properties of sediments.

In this study, we present a new paleointensity record from a siliceous clay core in the North Pacific (Core KR0310-PC1), which cover the last ca. 1.5 m.y. We compare the results with those from already published records from hemipelagic clay off New Guinea (Yamazaki and Oda, 2002; 2005). Despite large differences in variation patterns of magnetic properties, paleointensities agrees well with each other, suggesting that rock-magnetic contamination to paleointensity is small, if any.