大阪湾、北大西洋にみられる海洋同位体ステージ19の千年スケールの古海洋変動
Millennial scale paleoceanographic features during marine isotope stage 19 in Osaka Bay and North Atlantic

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Detailed variations of paleoclimate and paleoceanography are important to clarity the complex environments of Marine Isotope Stage (MIS) 19, a distinct interglacial, that includes a geomagnetic reversal and a cooling event, characterized by a unique orbital situation with minimum of the 400-kyr eccentricity cycle and small amplitude variations in insolation. We examined recently published or obtained high-resolution paleoceanographic data of MIS 19 to extract distinctive common features. Sea-level proxies based on diatom assemblage and grain size data from an Osaka Bay core with an average accumulation rate (a.r.) of 64 cm/kyr show precession-related signals of highstands 19.3 and 19.1, and lowstand 19.2. In addition, they show many sub-orbital scale features at a few kyr intervals, including features spanning for less than 1 kyr. These orbital and suborbital scale features are also observed in high-resolution marine oxygen isotope data from planktonic foraminifera from IODP site U1313, North Atlantic, where an average a.r. 5.4 cm/kyr is estimated. Using the features as tie-points, an age model for U1313 was constructed by transferring the astronomical ages of the Osaka Bay core. The age model shows the Matuyama-Brunhes boundary (MBB) at U1313, the effect of lock-in depth corrected, is dated to be 778 ka, which is 1 kyr older than that for Osaka Bay. High-resolution alkenone-based SST data from U1313 show the warmest interval lying after the MBB, as the warmest climate is observed in Osaka Bay. The age model shows that the warmest SST interval for U1313 ranges in age from about 776 to 772 ka, which is partly overlapped with the warmest climate interval from about 777 to 774 ka for Osaka Bay, both much delayed with the highest sea-level peak at 780 ka. The delayed post-reversal warming in Osaka Bay is interpreted to be caused by the climate cooling associated with the low field intensity during the reversal transition. The millennial scale features common for both sites are also observed in the core data from the Chiba section, a candidate for the GSSP for the early to middle Pleistocene boundary. The features are probably global.

キーワード：海洋同位体ステージ19、海水準変動、マツヤマ－ブリュンヌ境界、大阪湾、北大西洋
Keywords: MIS 19, sea-level variation, Matuyama-Brunhes boundary, Osaka Bay, North Atlantic

