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ウラン系列核種と海水準の同期変動
Uranium isotope composition changes with past climate changes

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Uranium series nuclides have unique chemical properties and have been widely used for determining the timing of the past climate changes (Edwards et al., 1988; Yokoyama and Esat, 2004; 2011). Rivers supply uranium to the oceans globally with excess 234U relative to secular equilibrium and 234U incorporated with coral skeletons can be used for dating. The 234U abundance in seawater, at the time the coral was growing, can also be measured independently. The reliability of Uranium series dates used in determining past sea-level variations is dependent on selecting pristine corals free from diagenetic alteration. A quantitative test for alteration assumes invariant 234U abundances in the oceans for at least the past ca. 500 kyrs and results from samples outside of a narrow range in modern ocean 234U abundance are excluded from data sets. It has been known that this can be constant and thus is able to use rigorous tests for diagenesis of corals. We combined data obtained from uplifted coral terraces in Papua New Guinea with previously reported values. A systematic trend emerges indicating shifts in the 234U/238U ratio at times of major glacial?interglacial transitions that involve large variations in sea-levels (Esat and Yokoyama, 2008; 2010). From last glacial to Holocene, the rate of change in 234U/238U is approximately 1 permil per thousand years. In this presentation, we introduce potential mechanism to explain these variations, which is closely linked to the sea-level changes and coastal environmental changes.

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