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Evidence for Diagenetic Re-distribution of Uranium in the Equatorial Arabian Sea

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TIMS analyses of ^{234}U-^{230}Th disequilibrium have been obtained for the last 300 kyr in core MD900963 from the eastern equatorial Arabian Sea (5º 03N and 73º 53 E, water depth of 2446 m). Authigenic U concentrations range from 1 to 5 μg/g (65-91%) based on ^{232}Th detrital correction and showed well defined 23 kyr precession cycle due to change in productivity and redox conditions within the sediments (Pailler et al., 2000). The measurements of $^{230}Th/^{232}Th$ also showed 23 kyr precession cycle which is in agreement with productivity pattern constructed based on coccoliths (Beaufort et al., 1997), planktonic foraminifera (Cayre et al., 1999) and alkenones (coccolithophorids) and brassicasterol (diatoms mainly) (Rostek et al., 1997 and Schulte et al., 1999). Bulk $^{234}U/^{238}U$ activity ratios are markedly departing from that predicted from the decay of initial sea water ratio (1.148 or $\delta^{234}U$ =148 per mil) in about 25% of the samples analyzed (excess or deficit ranging from -96±4 to +13±4 per mil). Three possible mechanisms are identified for the departure: remobilization of U, influence of detrital U and α-recoil effect (Henderson and Slowey, 2000). There is a rough positive correlation between authigenic U and the deviations from expected ratios of ($^{234}U/^{238}U$). This suggests that $\delta\ ^{234}U$ is less affected by either diagenetic processes or detrital contamination in high authigenic U events. On the other hand, there is also a broad negative correlation between $\delta^{234}U$ deviation and detrital U contribution. This further suggests low $\delta^{234}U$ are influenced by detrital U.

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