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Sediment gravity flow deposits triggered by typhoon, East China Sea Shelf, Western North Pacific

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Hybrid event beds and a debrite are identified in a core on the mid-shelf of East China Sea. Four units are divided according to abrupt boundary identification, with assistance of grain size analysis. The hybrid event beds typically comprise four internal divisions from the base to the top: (1) structureless muddy sand (H1a, high density turbidite); (2) massive muddy sand with mud clasts (H1b, higher density turbidite); (3) linked debrite (H3); (4) homogeneous mud (H5, fluid mud). The radiocarbon ages of the core were in the range of 3890–8526 yr BP. Based on correlation with other surrounding cores, the depositional age of hybrid event beds and the debrite may be less than 500 yr BP. The TOC and $\delta^{13}\text{C}$ values in event beds suggest a local erosional regime. The average $\delta^{13}\text{C}$ value for turbidite (H1a and H1b) is similar to the H3 division in the hybrid event beds, implying that the organic matter in the H1a, H1b and H3 may come from the same source area. The REE data reveals the sediment source is initially from Korean rivers. Bi-plots of $(\text{La}/\text{Lu})_{\text{UCC}}$ vs. $(\text{La}/\text{Y})_{\text{UCC}}$, $(\text{La}/\text{Y})_{\text{UCC}}$ vs. $(\text{Gd}/\text{Lu})_{\text{UCC}}$, $(\text{La}/\text{Yb})_{\text{UCC}}$ vs. $(\text{Gd}/\text{Yb})_{\text{UCC}}$ and $(\text{La}/\text{Yb})_{\text{UCC}}$ vs. $(\text{Sm}/\text{Nd})_{\text{UCC}}$ of four units in the core are concentrated in the similar range, indicating these event beds have the same source area. Both regimes that partial transformation from a debris flow and erosional bulking are suggested. It is unlikely that the debris flow is triggered by a hyperpycnal flow or a tsunami, because both can carry continental and/or coastal signals which have not been recognized in the core. Typhoon can be a probable triggering mechanism.

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