

## Classification of sediments in the Nankai Trough accretionary prism by Principal Component Analysis

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The Nankai Trough has been studied extensively for understanding the plate boundary process as the society is threatened by upcoming great earthquake. Nankai Trough Seismogenic Zone Experiments (NanTroSEIZE) in the framework of the Integrated Ocean Drilling Program (IODP) have been obtained seismological and geological data from direct sampling and in-situ measurement by drilling into the shallow accretionary prism. The feature of sediments forming the accretionary prism have been figured out based on analyses of drilled core and drill cuttings. Classification of the sediments by defining lithological units has been performed by mainly synthesis of observational results and log data. Analyses of mineral and chemical composition and gas composition were also important auxiliary data.

Here we try to classify the sediments based on the chemical composition using Principal Component Analysis (PCA), and estimate chemical processes relate to the depositional and diagenetic process of sediments and the formation process of the accretionary prism. We used major chemical compositions data of 6 IODP drill sites situated in Kumano forearc Basin, Slope sediment, Frontal thrust zone and Subduction input in the Nankai accretionary prism. The PCA results show that the sediments from the Kumano forearc Basin and accretionary prism were obviously distinguished in terms of chemical composition. Classification of the sediments is firstly sensitive to LOI, CaO and SiO<sub>2</sub> contents, and secondary relate to metallic elements such as MgO, Fe<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub>. It implies that the abundance in LOI and CaO is linked to diagenesis of sediments, and so does metallic components to their depositional source.

Keywords: the Nankai Trough accretionary prism, Chemical composition, Principal Component Analysis