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Structural Styles at Nankai Accretionary Prism from LWD Borehole Images at NantroSEIZE Exp. 314

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Logging-While-Drilling (LWD) is a technique to obtain geophysical data from drill holes immediately after drilling, thus is extremely useful to record the data in weak unconsolidated sediments, to avoid alteration of data due to invasion of drilling fluid to permeable lithology, and for non-riser drillings. Resistivity image of borehole wall is one of the most important LWD dataset to analyse structural deformation. We used it to extract structural features including bedding planes, fractures and borehole breakouts, and examine structural styles at four sites of IODP Expedition 314, Nankai Trough.

The poles to the bedding plotted in stereo-net projection are generally scattered but their clusters and girdle trends suggest deformation geometry closely related to the tectonic environment of this region. At the sites within the accretionary prism region, beds commonly dip to NW or to SE. The shallow interval within a few hundred meters from the sea floor generally show gentle (a few degrees) dips to SE, then intermediate intervals tend to incline steeper to NW or to SE. Beds in the footwall intervals at some sites that drilled out major thrusts show gentle or no deformation.

Fractures are mainly conductive and the poles to the fracture surfaces are also generally scattered at the sites, but their clusters suggest that the natural fractures typically dip steeply (60∼80deg) and can be classified into two groups. Fracture zones can also be identified in the intermediate interval of a site within the prism.

The sites drilled in prism regions show similar structural style, which can be correlated well with seismic profiles. The shallow intervals gently dipping to SE corre-

spond to slope sediments that sub-parallel to the ocean floor. The intermediate interval whose beds and fracture development suggests relatively deformed nature correspond to accretionary prisms or associated structural deformation. The deep intervals may correspond to the younger footwall sediments.

This result suggests the drilling intervals can be divided into slope sediments, deformed hanging-wall and little deformed footwall. These three structural domains as well as fracture zones identified in the borehole resistivity images are well-correlated with seismic profiles. LWD thus can be used to bridge the deformation architecture from core to seismic scales.