

Spatial crustal structure and its interpretation around the IODP proposed site in the Izu-Bonin Mariana arc

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The IODP proposed site: IBM-4 is located in forearc in Izu-Bonin Mariana (IBM) arc in order to drill the middle crust of IBM arc understanding of arc crust evolution and continental crust formation. Site IBM-4 have already drilled as ODP site 792B and obtained shallow crustal information. We carried out high density grid multi-channel seismic reflection (MCS) survey using tuned airgun in order to update knowledge of crustal structure around the site IBM-4 in KR08-09 cruise. Low-fold MCS survey is also carried out with 2 km spacing in site IBM-4 in KY08-08 cruise. Grid spacing of total MCS survey is 1 km.

Time-migrated MCS profiles along EW and NS profile across the site IBM-4 obtain the clear image of basement high (dome structure) beneath site IBM-4. The sedimentary layer is indicated the extensive normal fault system with graben structure in the western side of site IBM-4. Comparing our MCS profile with the core recovered from ODP site 792B shows that the sediments above basement high formed by silt, clay, pumiceous sand/sandstone and pumiceous gravel, of ages from the Quaternary to the upper Eocene. And andesitic lavas were sampled from 886 mbsf in ODP site 792B at the top of basement high. We reveal the spatial configuration of basement high around the site IBM-4 and crustal deformation by shallow faulting system.