

Preliminary results of anelastic strain recovery (ASR) measurements during IODP Expedition 337

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During IODP (Integrated Ocean Drilling Program) Expedition 337 "Deep Coalbed Biosphere off Shimokita", a deep riser-drilling borehole was penetrated to 2,466 meters below seafloor (mbsf) by D/V CHIKYU at Site C0020 in off Shimokita, Japan. To determine three-dimensional stress, we measured anelastic strain recovery of core samples caused by stress release. The measurements are time sensitive, so were conducted onboard the ship.

We collected seven whole round core samples from a depth range between 1,370 - 2,448 mbsf, and successfully obtained high-quality anelastic strain recovery data from six core samples. The successful ASR measurement of the core sample from 2,448 mbsf was the deepest application of ASR in ocean drilling programs. From the strain data, three-dimensional stress orientations were preliminarily determined. The shallower five core samples' strain data showed normal faulting stress regimes, whereas the deepest core sample from 2,448 mbsf reveals a nearly reverse faulting stress regime. In addition, the maximum horizontal stress orientations of all the six core samples were dominantly in west-east direction, and distributed between west-northwest and south-southwest.

We gratefully acknowledge the IODP for providing core samples used in this study and the supports of the IODP Expedition 337 scientists, D/V Chikyuu drilling crew, and laboratory technicians.

Keywords: Stress, ASR, IODP, Exp 337