

## Damaged mantle wedge in an active subduction zone: evidences from Mariana serpentinite seamounts

Katsuyoshi Michibayashi<sup>1\*</sup>, Ayano Fujii<sup>1</sup>, Patricia Fryer<sup>3</sup>, Teruaki Ishii<sup>2</sup>, Hirokazu Maekawa<sup>4</sup>

<sup>1</sup>Inst. Geosciences, Shizuoka Univ., <sup>2</sup>IFREE, JAMSTEC, <sup>3</sup>University of Hawai'i, <sup>4</sup>Osaka Prefecture University

Serpentinite seamounts uniquely occur in the Mariana and Izu-Bonin forearcs. Abundant serpentinitized peridotites and minor metamorphosed rocks have been sampled as clasts in the serpentine mud from the serpentinite seamounts. Above all, the discovery of blueschist-facies minerals revealed that some of these rocks must have been entrained in rising serpentine mud diapirs at 16 to 20 km depth and extruded from mud volcanoes onto the sea floor. Yet, the structure of the mantle wedge, where these clasts were derived from, is uncertain but intense serpentinization. Here, we present that the peridotites from the South Chamoro seamount could result from a damaged mantle wedge during spatial and temporal evolution of the subducting Pacific plate structure along the Mariana arc, whereas the serpentinitized peridotites dominantly show common evidences for deformation in higher-temperature asthenosphere of the mantle wedge with minor subsequent lower-temperature lithospheric strain. This finding may explain trench-parallel flow and seismic anisotropy in the Mariana subduction system.

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