A fossilized partially molten oceanic mantle lithosphere inferred from olivine crystal preferred orientation

Katsuyoshi Michibayashi[1]; Norihiro Odashima[2]; Toshiki Ina[3]

[1] Inst. Geosciences, Shizuoka Univ; [2] Geosciences,Shizuoka Univ; [3] Inst Geosciences, Shizuoka Univ

The oceanic upper mantle lithosphere is thought to develop intense olivine crystal preferred orientation (CPO) with an a axis maximum parallel to mantle flow direction. Recent experimental work suggests that the presence of melt weakens the alignment of a axis, resulting in more diffuse CPO pattern: a and c axis girdles in the shear plane with strong concentrations of b axes normal to the shear plane. We demonstrate such diffuse patterns co-existing with a axis maximum CPO patterns in the Oman ophiolite, indicating that such partially molten phase may be rather ubiquitous in the oceanic mantle lithosphere.