

Microfabrics of peridotites from the Mount Melbourne, Antarctica

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Peridotite xenolith can be useful to delineate the structure and evolution of mantle. We analyzed peridotite xenoliths collected around the Mount Melbourne, Northern Victoria Land, Antarctica, to understand upper mantle structure beneath the West Antarctic Rift System. The samples are massive hence the V_P -Flinn diagram is applied for identifying the types of olivine LPO (Michibayashi et al., 2016, EPSL) to resolve undefined foliation and lineation. Five samples contain the D-type olivine characterized by the lineation-parallel [100] and lineation-normal [010]. One includes the A-type olivine defined by the lineation-parallel [100] and foliation-normal [010]. Both olivine types are formed under poor water and various stress conditions, which might be existed in lithosphere or shallow mantle. Our results suggest that partial melts at shallow depth (volcanism) may deliver the peridotite in lithosphere to the surface. In addition, analyzed olivine shows up to 14.1% of V_P anisotropy therefore diverse mantle flow can be possible candidate to explain the occurrence of low velocity zone beneath the Mount Melbourne.