

Diversity and microstructure of ultramafic pseudotachylytes from the Balmuccia peridotite, Ivrea Zone, Italian Alps

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Ultramafic pseudotachylyte seems to be a rare phenomenon and hitherto only one occurrence has been known, from the Balmuccia peridotite, Ivrea Zone, northern Italy (Obata and Karato, 1985). A diversity of pseudotachylyte may be seen in this area, including the fault vein type and injection vein type of Sibson (1975). We report in this presentation some more additional observation and comment on the 'fault vein pseudotachylyte' that we presented at the last year Annual meeting (Obata and Karato, 2004) and present new results on another sample of fault vein type pseudotachylyte. This new sample is the one taken from a thrust fault plane (from the same outcrop), which is considered to be of a later generation fault than the one presented last year. The fault rock has a more complex structure than the other one, consisting of fault gouge, breccias, mylonites and cataclacites that contain numerous veins of pseudotachylyte. The host rock is granular spinel lherzolite. Approaching the fault plane, brittle deformational features dominate over ductile features in the lherzolite host, and in adjacent to the fault plane, titaniferous hornblende and ilmenite become abundant. Numerous pseudotachylyte veins are developed in the hornblende zone mostly along the fracture planes in the rocks and single crystals. Small blocks and segments of the breccia have been displaced and rotated to some extent with each other forming vein networks of pseudotachylyte. It is interesting to see similar structures as reported in the literature from pseudotachylyte generation zones that are observed on outcrop scales from other localities may be seen in a small scale within a thin section. Moreover, from textural observation, the amphibolitization of spinel lherzolite is inferred to have preceeded the faulting and the pseudotachylyte formation, which indicates that the metasomatic alteration and mass transfer may have taken place associated with the shear movement.

Obata, M. and Karato, S.(1995) *Tectonophysics*, 242,313-328.