Uppermost mylonite zone and pseudotachylyte in crustal rocks exposed in the Hidaka metamorphic belt, Hokkaido, Japan

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We present an example of strain localization in the greenschist facies mylonite zone and seismogenic slip processes in the high strain zones formed by plastic deformation.

Many mylonite zones are found in the Hidaka metamorphic belt, Hokkaido, Japan. The uppermost mylonite zone occurs in the uppermost part of the middle tonalite body and consists of one or two narrow tonalite mylonite zones formed under the greenschist facies conditions. The tonalite mylonite zones are ca. 15 m wide at maximum, extending to ca. 6 km long at maximum. There are several narrower ultramylonite zones inside the mylonite zones. The mylonite zones are in direct contact with non- or very weakly mylonitized tonalites, but not surrounded by weakly-moderately mylonitized tonalites. In the ultramylonite or strongly mylonitized zones (the central parts of the mylonite zones), narrow pseudotachylyte or ultracataclasite veins are found. The veins are parallel or subparallel to the mylonitic foliation in the central parts of the mylonite zones, which is mainly defined by preferred dimensional orientation of micas. Some of the pseudotachylytes and cataclasites show mylonitic foliation. The pseudotachylytes resulted from seismogenic slip along the mylonitic foliation of the high strain concentration zones formed by plastic deformation.