G122-008 **Room: 101B** **Time: May 25 11:00-11:15**

Mechanism transition of giant solid intrusion of metamorphic complex

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Giant Metamorphic Dyke called by Toriumi is unique process in the wedge mantle behind the subduction zone, because it occurs as intrusion mechanism of deeply subducted buoyant materials in the earth as like as serpentinite intrusion from hydrated wedge mantle. The viscous drag model can interpret the aperture sensitive intrusion velocity of the GMD but it is confused that small scale high pressure metamorphic belts are very common in orogenic belts. It is because the velocity is proportional to the aperture size of GMD in the viscous drag model.

The frictional drag mechanism of GMD can be possible if the normal stress operated along on the surface of GMD is not so large. If this is the case, the small size UHP and HP metamorphic rocks can be intruded from deep upper mantle to the earth surface because the frictional drag is not related to the velocity of the intrusion. Thus, the author intends to propose two mechanisms of intrusion process of the GMD. Further it is strongly predicted that the frictional drag mechanism appears in the shallower depth rather than viscous drag mechanism. The critical depth of this mechanism transition is a function of aperture of GMD and temperature gradient of the mantle.

On the other hand, the mechanism transition from viscous drag to frictional one must be determined by the balance of the drag as follows:

as the frictional drag holds

Ff = 2pR2 mP

where m is the frictional coefficient and Pc is the critical pressure (normal stress) on the boundary surface of the GMD, the balance equation becomes following,

Pc = Vh/mL.

It is natural that in the lower pressure than Pc the viscous drag is larger than that of frictional drag. In the frictional drag regime, the mean velocity of the GMD becomes V = KL1/2. Thus the diagram between aperture and velocity of GMDs must show two segments of L1/2 and L2 as supported by the natural metamorphic belts.