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AMS study on Tanzawa tonalite and its emplacement mechanism

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The Tanzawa tonalite is an elongated discordant pluton with a length of about 25km in EW and a width of about 5km in NS, which emplaced into Miocene submarine arc volcanics at about 7Ma.

AMS (: Anisotropy of Magnetic Susceptibility) measurement carried out at 107 sites on Tanzawa main tonalite, using Kappabridge KLY-3S (AGICO inc., Czech Rep.). According to field survey and microscopic observation, Obtained magnetic fabric is classified into primary magmatic fabric and secondary tectonic fabric. Based on distribution of magmatic fabric and petrology, Tanzawa main tonalite is divided into four domains, named Ishiwariyama, Mizunokisawa, Murokubogawa and Kurokuragawa from west to east. The Murokubogawa and Mizunokizawa units show lateral zonation with mafic margin (53• 59wt%SiO_2) grading to felsic core (64• 69wt%SiO_2), while the Kurokuragawa and Ishiwariyama units are rather homogeneous and felsic in composition (69• 72wt%SiO_2). Strikes of magmatic foliations are concordant with the edge of each domain. Subvertical foliations dominate except for the area near the center of each domain. Subvertical lineations that imply upwelling center of the tonalitic magma appear at the edge of each domain excluding the Ishiwariyama unit. It indicates that central blocks in each emplacement-unit were subsided and magmas moved upward along the margin of large down-going blocks and spread under the roof. Cumulous magmas emplaced finally and composed mafic margin of Murokubogawa and Mizunokizawa unit. The magnetic foliation and lineation in the Ishiwariyama unit are disturbed by the local thermal convection induced by the input of high temperature magma through syn-plutonic dikes.

The strike of syn-plutonic dikes indicates that • Hmax is almost EW and • Hmin is NS when tonalite magma was emplaced, which is concordant with the sense of left lateral dislocation of deformational tectonic foliations with NW-SE strike. The Tanzawa tonalite emplaced under regional transtensional tectonics.