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An AMS study of the Takidani pluton (Japan)

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Large plutonic bodies are typically constructed incrementally often by under-accretion of distinct successive magma pulses. Petrography and geochemistry of the Takidani Pluton (1.54 Ma $\pm$ 0.23 Ma) in the Northern Japanese Alps show that the chemical and textural variability observed at the roof of this intrusion is best explained by the segregation of residual melt from a crystallising magma body. We carried out a magnetic susceptibility survey (bulk susceptibility and anisotropy of magnetic susceptibility) to identify the structures associated with the emplacement and extraction of residual melts from a magmatic mush. Additionally, we determined shape preferred orientations (SPO) of amphibole at several locations within the Takidani pluton.

From bottom to top of the intrusion, the bulk susceptibility is about constant in the main granodioritic part, decreases roofwards within the porphyritic unit, before increasing again within the marginal granodiorite close to the contact with the overlaying Hotaka Andesite. Such variability mimics the major and trace elements compositional variability measured in the whole rock samples. Magnetic foliations are observed at the western tectonic contact of the pluton potentially indicating overprint, while most other magnetic fabrics across the pluton are characterised by triaxial ellipsoids of magnetic susceptibility or magnetic lineations.

Our preliminary data and the lack of internal contacts indicate that Takidani Pluton was likely emplaced as a series of successive magma pulses finally merging to produce a large connected magma body. While amphibole foliations may likely be the results of super-solidus tectonic overprint, anisotropy of magnetic susceptibility data may be related to post-emplacement melt segregation.