

ミネソタ花崗岩類の低温磁気特性

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Low temperature magnetic properties of the Precambrian granitic rocks in Minnesota

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Paleointensities of the geomagnetic field during the Archean and Proterozoic could give constraints on the history of the deep interior of the Earth. In the present study, we collected pilot samples from the granitic rocks in Minnesota with radiometric ages of about 3.0, 2.5, 1.8 Ga. First we measured low temperature magnetic properties of those samples in order to select suitable samples or sites for paleointensity determinations.

Low temperature measurements were made using MPMS. We measured the change of saturation remanence (SIRM) produced at 300K and taken in cooling-heating cycle through 6K. Also, we measure that of SIRM given at 6K (after a zero-field and field cooling) and heated up to 300 K.

For the samples from the Sacred Hart granite of about 2.5 Ga, the Verwey transition is clearly recognized at about 120K. The low-temperature memories (LT memories) are 30-70% of the initial SIRMs. These LT-memories are thought to be carried by elongated single-domain magnetite grains. Therefore, those samples may be suitable for paleomagnetic studies if those magnetite grains are primarily formed in the granitic rocks.

We will also report the results from other granitic rocks.