Paleomagnetic study of Proterozoic mafic dikes at the Mt. Riiser-Larsen area in Enderby Land, East Antarctica

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The Archaean Napier Complex and Proterozoic mafic dikes intruding the complex in Enderby Land, East Antarctica, are one of the important research targets for obtaining paleomagnetic information which will clarify the formation process of supercontinents and the characteristics of the ancient geomagnetic field. We performed a two-month field work for paleomagnetic sampling on the Napier Complex and mafic dikes in the Mt. Riiser-Lasen area on the coast of Amundsen Bay in Enderby Land during the summer operation period of the 42nd Japanese Antarctica Expedition (JARE-42, Nov. 2000-Mar. 2001). In this paper, we will report results of paleomagnetic measurements of the mafic dike samples.

In the Mt. Riiser-Larsen area, the NE and N-S trending mafic dikes, doleritic and basaltic dikes, are distributed abundantly, and the E-W trending dikes are also observed. Ishizuka and Suzuki (1999, 2000) pointed out the diversity in the origin of the dikes based on geochemical data. The 1.9 Ga and 1.2 Ga of Rb-Sr and Sm-Nd isochron ages (whole rock) were reported from the NE and N-S dikes, respectively (Suzuki et al., 2000). We collected a total of 419 paleomagnetic samples at 35 sites of the NE dikes, 14 sites of the N-S dikes and 4 sites of E-W dikes by hand sampling and by using a engine power core driller.

Progressive demagnetization results indicated that almost all samples had two or three stable magnetic components. The low-stability (L) components, which were isolated below 280-320 degrees centigrade during thermal demagnetization experiments, were characterized by deep negative inclination. The L component is probably of viscous remanence (VRM) origin, produced in the recent geomagnetic field. The high-stability (H) component were observed in the temperature range between 480 and 580 degrees centigrade, indicating Ti-poor titanomagnetite as a carrier of the H component. The dominant directions of the H components shows W to SW declination with negative inclination for the NE and E-W dike samples, while SE to W declination with positive inclination for the N-S ones.