

Paleointensity measurements of pyroclastic flows co-born with widespread tephtras from Kyushu, Japan

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We report the results of paleointensity determination of welded pyroclastic flow deposits co-born with widespread tephtras derived from Kikai (K-Ah, 7.3 ka), Aira (AT, 28 ka), and Aso (Aso-1, 270 ka; Aso-2, 140 ka; Aso-3, 120 ka; Aso-4, 90 ka) calderas in Kyushu island, Japan. Because the widespread tephtras are commonly used as good key layers, their ages and oxygen isotope stages have been well established. Therefore, absolute paleointensity determinations from these pyroclastic flows can potentially provide the calibration points for relative intensity secular variation curves obtained from sedimentary cores. The results of the thermal demagnetizations showed that the samples of all eruptive units had stable remanent magnetizations. Suitability for the paleointensity measurement was also examined by several rock magnetic experiments. Using Thelliers' method with several consistency checks, we obtained the reliable paleointensities from six eruptive units. From these results, the virtual dipole moment (VDM) values ranging from 2.7 to 9.7 (10^{22}Am^2) were calculated and compared with Sint-800. The results from K-Ah, AT, Aso-4, and Aso-1 are consistent with Sint-800. On the other hand, Aso-2 and Aso-3 seem to conflict with Sint-800. The result of Aso-3 indicates a moderate VDM value of 6.2 (10^{22}Am^2) at 120 ka. The results of Aso-2 yielded abnormal paleomagnetic directions and weak intensity of 2.7 (10^{22}Am^2) at 140 ka. Considering that we can find similar features in several sedimentary core data, it may suggest that the geomagnetic field at the age of Aso-3 is in a recovering state during Blake event or of the beginning of Blake event, and that there was an excursion-like event at the age of Aso-2 (ca. 140 ka) between Blake and Jamaica events.