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Effects of Inefficient Demagnetization on Isothermal Remanent Magnetization Curves of Weak Samples

Daniele Brandt (Universidade de São Paulo), Plinio Jaqueto (Observatório Nacional), Marina Kuhn Queiroz (Universidade de São Paulo), Julia Massucato-Silva (Universidade de São Paulo), Julia Sobral Coutinho (Universidade de São Paulo)

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Isothermal remanent magnetization (IRM) curves are essential for characterizing rock magnetic mineralogy, but their reliability depends critically on the sample's initial magnetic state. This study examines the impact of ineffective demagnetization before IRM acquisition, focusing on weak samples. A total of 90 curves were measured in 150 steps using a vibrating sample magnetometer (VSM), following two demagnetization protocols: (i) alternating field in a shielded device, and (ii) alternating field generated by the VSM's electromagnets. The latter resulted in residual remanence and distortions in curve shape, potentially causing systematic interpretation errors, particularly in weak samples. Simulations based on the Stoner–Wohlfarth model confirmed that ill-demagnetization can affect IRM curve shape. These results highlight the importance of applying effective and standardized demagnetization procedures, especially when working with weak samples. Supported by PRPI–USP.