Title: Palaeomagnetic study of a subaerial volcanic ridge (Sao Jorge Island, Azores) for the past 1.3 Myr: evidence for the Cobb Mountain Subchron, volcano flank instability and tectonomagmatic implications

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Abstract: We present a palaeomagnetic study on 38 lava flows and 20 dykes encompassing the past 1.3 Myr on S. Jorge Island (Azores ArchipelagoNorth Atlantic Ocean). The sections sampled in the southeastern and central/western parts of the island record reversed and normal polarities, respectively. They indicate a mean palaeomagnetic pole (81.3 degrees N, 160.7 degrees E, K= 33 and A95= 3.4 degrees) with a latitude shallower than that expected from Geocentric Axial Dipole assumption, suggesting an effect of non-dipolar components of the Earth magnetic field. Virtual Geomagnetic Poles of eight flows and two dykes closely follow the contemporaneous records of the Cobb Mountain Subchron (ODP/DSDP programs) and constrain the age transition from reversed to normal polarity at ca. 1.207 +/- 0.017 Ma. Volcano flank instabilities, probably related to dyke emplacement along an NNWSSE direction, led to southwestward tilting of the lava pile towards the sea. Two spatially and temporally distinct dyke systems have been recognized on the island. The eastern is dominated by NNWSSE trending dykes emplaced before the end of the Matuyama Chron, whereas in the central/western parts the eruptive fissures oriented WNWSE controlled the westward growth of the S. Jorge Island during the Brunhes Chron. Both directions are consistent with the present-day regional stress conditions deduced from plate kinematics and tectonomorphology and suggest the emplacement of dykes along pre-existing fractures. The distinct timing and location of each dyke system likely results from a slight shift of the magmatic source.

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