



High-resolution Late Pleistocene paleomagnetic secular variation record from Laguna Potrok Aike, Southern Patagonia (Argentina): preliminary results from the ICDP-PASADO drilling

Agathe Lisé-Pronovost (1,2), Guillaume St-Onge (1,2), Torsten Haberzettl (1,2), and PASADO science team (3)
(1) Institut des sciences de la mer de Rimouski (ISMER), Université du Québec à Rimouski (UQAR), (2) GEOTOP research center, (3) <http://www.pasado.uni-bremen.de/index.html>

High-resolution paleomagnetic reconstructions from sedimentary sequences are scarce in the Southern Hemisphere. Therefore, the millennial- to centennial-scale variability of the geomagnetic field is under-represented in the Southern Hemisphere relative to the Northern Hemisphere and the possible global nature of that variability cannot be assessed. Here we present the first high-resolution Late Pleistocene paleomagnetic secular variation (PSV) reconstruction from the continental archive Laguna Potrok Aike south of 42°S in South America. Laguna Potrok Aike (51°58'S, 70°23'W) is a maar lake located in the Pali Aike Volcanic Field in southern Patagonia (Argentina). Previous studies revealed very high Holocene sedimentation rates (> 100 cm/ka) in the center of the lake. During the austral spring 2008, the multi-national Potrok Aike maar lake Sediment Archive Drilling prOject (PASADO) science team drilled two ~100 m holes under the framework of the International Continental scientific Drilling Program (ICDP). A preliminary Holocene age model based on comparison of magnetic susceptibility data from the PASADO core with the well-dated (radiocarbon- and tephra-based chronology) core located nearby in the center of the lake (PTA03-12) indicates a continuous deposition of ~19 m of lacustrine sediments since the last 16 ka cal. BP.

Hysteresis measurements using an alternating gradient force magnetometer indicate a magnetic assemblage dominated by magnetite grains in the pseudo-single domain range. Principal component analysis (PCA) inclination and declination profiles were constructed from the stepwise alternating field demagnetization of the natural remanent magnetization (NRM) measured on u-channels at 1 cm intervals using a 2G Enterprises cryogenic magnetometer. The PCA inclinations vary around the expected geocentric axial dipole (GAD) inclination for the latitude of the coring site and the maximum angular deviation (MAD) values are generally lower than 5°, indicating high quality paleomagnetic data. The PSV record from Laguna Potrok Aike is compared with the available records from marine sediments in the southern Atlantic and Pacific oceans, as well as from lacustrine sediments further north in Argentina to assess the genuine geomagnetic origin of the recently drilled record and to determine the millennial- to centennial-scale variability of the geomagnetic field during the Late Pleistocene for the mid-latitudes of the Southern Hemisphere.