MAGNETOSTRATIGRAPHY OF OLIGO-MIOCENE CONTINENTAL RED BEDS: SALAR DE ATACAMA NORTHERN CHILE

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The Oligo-Miocene Paciencia Group is well exposed to the north and along the western margin othe the Salar de Atacama, a large (400km^2) Mesozoic-Tertiary basin in the central Andes of northern Chile. The stratigraphy of this Group is complex and records the sedimentological response to extensional and compressional phases of the basin history. There are no biostratigraphical constraints and base level controls are essentially tectonic or climatic. Facies variations are thus complex and correlations within the basin cannot be made using conventional methods.

Magnetostratigraphy is powerful tool in the study of continental sediments. The technique involves systematic sampling and measurement of the natural remanent magnetization (NRM). Thermal demagnetization is used to isolate discrete components of magnetization and identify those which relate to the depositional age of the rocks. In this way periods of normal or inversed polarity (Chrons) can be identify and the sequence dated by comparison with the Geomagnetic Polarity Time Scale (GPTS).

The upper and lower age limits of the Paciencia Group can be constrained using radiometric ages from comtemporaneous ash horizons. The sequence lies between 17 and 41 Ma years which is equivalent to Chrons 6-16. More precise age estimates can be made from the magnetostratigraphies of key sections in the San Bartolo Dome and near San Pedro de Atacama. In all five key sections have been studied and individual magnetrostratigraphies are currently being generated for all of them with a view to making detailed correlations.

The results of this study show that magnetostratigraphy is a powerful tool for dating and correlating continental and other palaeontologically barren sequences.

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