

## **PALAEOMAGNETIC STUDIES OF FAULT BLOCK ROTATIONS IN RELATION TO TRANSTENSION ON THE ATACAMA FAULT SYSTEM AND GRANITE EMPLACEMENT**

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### **RESUMEN :**

Los resultados palaeomagnetic de rocas del Formación La Negra de la Cordillera de la Costa, entre 26° y 27° S, presenta dirección rotaciones horarias 35°. Esta rotacion son probablemente un resultado de movimientos rotacionales in situ de bloque, esta resultado rotacion compuesta Juarsico y Cretacico.

**KEY WORDS :** Palaeomagnetism Jurassic Rotation Atacama Chile

### **INTRODUCTION**

Palaeomagnetic studies of Jurassic and Cretaceous volcanic, sedimentary and intrusive units of the Coastal Cordillera of northern Chile have revealed the widespread occurrence of clockwise crustal block rotation. In contrast to this similar aged units in northernmost Chile, southern Peru and Bolivia have undergone anticlockwise rotation. These rotations have been viewed as being complimentary to one another and interpreted in terms of oroclinal bending (Kono et al., 1985), differential shortening across the arc induced by the pre-existing shape of the Pacific margin of South America (Isacks, 1988) or systematic regional shear of the forearc region (e.g. Beck, 1988). Fundamental to these models is the kinematic control of strike-slip fault systems on fault block rotation. This study aims to integrate the palaeomagnetic determination of the magnitude of fault block rotations with the detailed structural analysis of the kinematics of the block bounding faults in relation to transtension on the Atacama Fault System and the emplacement of plutonic complexes within the arc.

### **GEOLOGICAL SETTING**

The area studied lies between 26 and 27° S and to the east of the Upper Palaeozoic Chañaral Melange (Bell 1987) and is bounded by the El Salado segment of the Atacama Fault System. The structurally highest unit is the Le Negra Formation thought to be of Upper Sinemurian to Lower Bajocian or Kimmeridgean in age and which is underlain by the Pan de Azucar formation of Hettangian-Sinemurian age (Naranjo 1978). These are separated from the basement and cut by, brittle, listric, left normal faults linked to the sinistral strike-slip faults of the Atacama Fault System. These units are intruded by Jurassic (c. 153 Ma) and Cretaceous (c. 127 Ma) wedge shaped plutons which are elongate parallel to the arc and young systematically to the east. These plutons are in turn cut by a series of dyke swarms which account for up to a further 15% East-West dilation of the area and which also systematically young to the east.

Over 80 palaeomagnetic sampling sites have been collected from the andesitic flows, tuffs