

Structural and Anisotropy of Magnetic Susceptibility study of the Neogene deformation recorded in Cordillera Frontal and Western Sierras Pampeanas, along the Valle Ancho-Sierra de Hualfín transect (27 ° 30'S): Preliminary Results

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In the most southern part of the Puna Plateau, along the northern transition between the normal and flat slab subduction segments (27°30'S), the Cordillera Frontal and Sierras Pampeanas are the first order morpho-structural units that conform the argentinean Andes. Our work focuses on the study of the Andean deformation that occurred mainly during the Miocene to the Quaternary, and seeks to contribute to the understanding of the spatio-temporal evolution of the deformation recorded along the Valle Ancho-Sierra de Hualfín transect (27 ° 30'S). To achieve this goal, we carried out: (1) a detailed structural mapping of this selected areas, (2) analysis of kinematic indicators measured in more than 700 fault planes, using Faultkin v.8 software (Allmendinger, 2018), and (3) analysis of anisotropy of magnetic susceptibility (AMS) in Neogene and basement rock samples, which are integrated with paleostress analysis of fault-slip data, and allow us to determine spatio-temporal variations in the stress field and in the intensity of the deformation.

Preliminary results show that, in eastern side of Cordillera Frontal at this latitude, a deformation event associated with NW-striking fault systems with strike-slip kinematics, mainly sinistral, affected late Miocene and Pliocene volcanic deposits. Also, we documented the same deformation in Quaternary deposits, evidenced by morphological features which suggest sinistral displacements of fluvial and alluvial-fluvial deposits along lineaments parallel the main fault-traces. This tectonic style is superimposed on a previous contractional regime because it affects reverse faults and anticline folds, in which maximum contractional direction was E-W. Out of the Cordillera Frontal, in Western Sierras Pampeanas, the deformation in Neogene sequences is predominantly contractional, characterized by low wavelength folds and N-S inverse faults whose kinematics show an E-W direction of contraction in the Fiambalá basin, with local variations NE to E in the easternmost sectors, corresponding to the Sierra de Hualfín and Puerta de Corral Quemado areas. Morphological and structural observations suggest that this contractional regime was maintained even in the Quaternary times. In this way, we report during the late Cenozoic Andean deformation, a contractional event previously to a sinistral strike-slip deformation active until in Quaternary times in the eastern Cordillera Frontal, and a transpressional-contractional deformation in western Sierras Pampeanas, from late Miocene to the Present.