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ANISOTROPIC PHYSICAL PROPERTIES AT SAMPLE SCALE AND THEIR EVOLUTION WITHIN FOLD-THRUST STRUCTURES

Laurent Louis, Philippe Robion, Christian David, Dominique Frizon de Lamotte

Université de Cergy-Pontoise
Département des sciences de la terre
8, Avenue du Parc - Le Campus, bât. I
95031 Cergy-Pontoise
Corresponding author: Laurent.louis@geol.u-cergy.fr

During the last decade, anisotropy of magnetic susceptibility (AMS) has been extensively used in fold-thrust belts. The aim was to point out changes of the rock fabric occurring during folding and, more precisely, to follow the deformation path of involved sedimentary rocks. The net result is that magnetic fabrics of folded sedimentary rocks are always of tectonic origin with, in some cases, development of a magnetic foliation perpendicular to the bedding. From this, one can ask the following questions: what microstructure feature can account for such observations and are the macroscopic features and properties, especially transport properties, sensitive to the rise of perpendicular to bedding fabric? In order to investigate these questions, we present here the results obtained from coupled AMS and ultrasonic measurements. As acoustic properties are directly linked to the rock structure and composition, AMS interpretations may be reinforced if some correlation is found between these two properties. Microstructural studies, electrical conductivity and water permeability measurements have been performed to complete the characterisation of rock properties. A complete study of these anisotropic physical properties on a reference sample (red sandstone from the Vosges region, France) will be presented. Then we will show preliminary results on sets of samples coming from different foredeeps: Potwar (Pakistan), Atlas (Morocco), Pyrenees (France).