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Fibrous gypsum veins as diffuse features and within fault zones: the case study of the Pisco Basin (Ica desert, southern Peru)

Andrea Rustichelli (1), Claudio Di Celma (1), Emanuele Tondi (1), Patrick Baud (2), Sergio Vinciguerra (3,4,5)

(1) School of Science and Technology, Geology Division, University of Camerino, Italy, (2) Laboratoire de Géophysique Expérimentale, EOST Strasbourg, Université de Strasbourg/CNRS UMR 7516, France, (3) Department of Earth Sciences, University of Turin, Italy, (4) British Geological Survey, UK, (5) Department of Geology, University of Leicester, UK

New knowledge on patterns of fibrous gypsum veins, their genetic mechanisms, deformation style and weathering are provided by a field- and laboratory-based study carried out on the Neogene to Quaternary Pisco Basin sedimentary strata (porous sandstones, siltstones and diatomites) exposed in the Ica desert, southern Peru. Gypsum veins vary considerably in dimensions, attitudes and timing and can develop in layered and moderately fractured rocks also in the absence of evaporitic layers. Veins occur both as diffuse features, confined to certain stratigraphic levels, and localised within fault zones. Arrays formed by layer-bounded, mutually orthogonal sets of steeply-dipping gypsum veins are reported for the first time. Vein length, height and spacing depend on the thickness of the bed packages in which they are confined. Within fault zones, veins are partly a product of faulting but also inherited layer-bounded features along which faults are superimposed.
Due to the different petrophysical properties with respect to the parent rocks and their susceptibility to textural and mineralogical modifications, water dissolution and rupture, gypsum veins may have a significant role in geofluid management. Depending on their patterns and grade of physical and chemical alteration, veins may influence geofluid circulation and storage, acting as barriers to flow and possibly also as conduits.