

THE MULTI SCIENTIFIC APPLICATIONS OF TECTONOFRACTOGRAPHY

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Fractography concerns the analysis of fracture surface morphology (or fracture markings) and related features, and their causes and mechanisms in engineering materials. Tectonofractography relates to tectonics and tectonophysics and applies fractographic analysis to rock fractures and to regional fracture systems (joint sets), with the objectives of identifying the tectonic processes that produced the fractures, and determining the mechanical conditions involved. These techniques are also applicable to rock mechanics, granite petrology, geophysics and archeological-prehistory.

Joints in sedimentary rocks are divided into four, the burial, the syntectonic, the uplift and the post-uplift groups. The four joint groups are being exposed to different fracture conditions. Consequently, they attain distinct spatial, fractographic and hydrogeological properties.

Tectonofractography is currently being used to analyse the ranges of stress conditions (stress intensity and fracture velocity) under which fracture developed in the Variscan granites of Central Europe.

Fracture propagation is often a macro-sight which involves breaking of atomic bonds and atomic oscillations that induce emissions of electrons and electromagnetic radiation, EMR. It has been claimed that the EMR amplitude sharply increased hours or even days before an earthquake. Possibly because EMR is emitted during early nucleation of rock failure, compared to seismic warning that is more associated with the rock failure. The EMR properties is now being characterized by combined rock mechanics and fractographic methods.