



## **Pressure Stimulated Currents correlated with Acoustic Emissions during the application of mechanical stress on marble samples**

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When a brittle material is subjected to mechanical stress up to the level of fracture, weak electric current emissions related to the mechanical status of the sample are detected. Such electric current emissions are rendered under the term Pressure Stimulated Currents. In this work marble samples were subjected to continuously increasing mechanical stress at a constant rate up to fracture. During this procedure the sample was placed in a shielded cage in order to avoid electric noise from affecting the measurements. The emitted PSC was recorded with a sensitive programmable electrometer while the applied stress and the yielded strain were measured through a load cell and a strain gage bridge respectively. Concurrent Acoustic Emission (AE) measurements were conducted with the use of a high sampling rate acquisition system.

In this work, for the very first time the PSC emissions are correlated with the AE events. From the experimental results it becomes clear that when the electric current shows significant excitation, concurrent high power AE events are recorded. The phenomenon becomes more obvious in the vicinity of fracture where the mass cracking that guides fracture leads to a significant number of high power AE events. This observation clearly verifies PSC theory since it shows that the recorded PSC is a consequence of the cracking process.