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## Characterization and Classification of Rocks with Lamb Modes

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### ABSTRACT

The nondestructive investigation by ultrasound has become a fundamental tool for characterizing rocks. We applied this technique for characterizing samples of rocks. The later had been members of the following three big families of geological classification: magmatic rocks, metamorphic rocks, sedimentary rocks. The method usually used is based on the measurement of ultrasound parameters, *i.e.* the longitudinal and transversal propagation velocities. The measurement of these parameters allows to determine the mechanical properties of each rock. These studies do not allow to find the three big axes of the rocks. In this work we show for each rock his corresponding ultrasonic signature by the use of his experimentally determined Lamb dispersion curves. The obtained results put in evidence that the descending slope of the Lamb modes is a reliable and efficient criterion for classifying rocks by ultrasound. This is an adequate solution for a good classification of rocks. It gives a high precision, it is reliable and quick and last not least cheap.

### KEYWORDS

Ultrasound; Lamb Waves; Nondestructive Investigation; Magmatic Rocks; Metamorphic Rocks; Sedimentary Rocks

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