

Supplementary Material for: Experimental insights into factors influencing V_p/V_s ratios at the Nevado del Ruiz Volcano, Colombia

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Aguilera Bustos & Adam (2023) should be cited if this material is used independently of the article.

For P- and S-wave measurements for the isotropic rocks and at room conditions, we use Olympus ultrasonic transducers (central frequency = 0.5 MHz). The transducers are aligned on opposite sides of the samples parallel to the cylinder axis (Figure S1). The contact between the transducers and the sample is improved by using a shear couplant and setting the system in a vice to apply a small axial stress on the transducers.

We identified foliation by macroscopically observation in the Cajamarca Group formations Schist and Meta. To estimate wave anisotropy in such samples, two plugs of each formation were cored. Coring relied on visually identifying foliation and coring parallel and perpendicular to the foliation. For the foliated rocks, P- and S-waves were recorded at room conditions for different angles rotating the transducers on the core walls as indicated in Figure S1. In the case of the S-waves, the acquisition was carried out with the polarization parallel to the cylinder axis.

At effective pressures, P- and the two cross-polarized S-waves ultrasonic waves (1 MHz central frequency) were acquired. Samples were measured dry and water-saturated (Pore pressure constant at 3.4 MPa at effective pressures between 3.4 MPa and 69.0 MPa. Effective pressure is the difference between the confining and fluid pressures acting on the rock. Figure S2 is a sketch of the experimental setup used to acquire P- and S-waves under effective pressures.

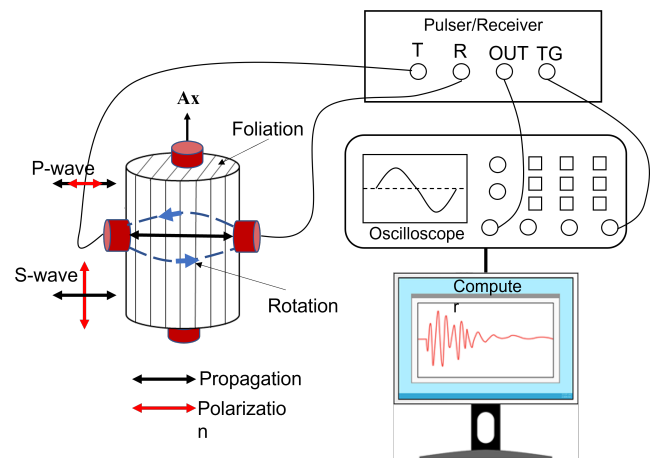


Figure S1: Laboratory setup for atmospheric ultrasonic measurements. The transducers located parallel to the cylinder axis were used for the isotropic samples. For angle variations, P- and S-wave ultrasonic transducers were positioned on the core wall of the foliated samples and rotated along the circumference of the sample with propagation perpendicular to the cylinder axis (Ax). T: Transmitter. R: Receiver. TG: Trigger.

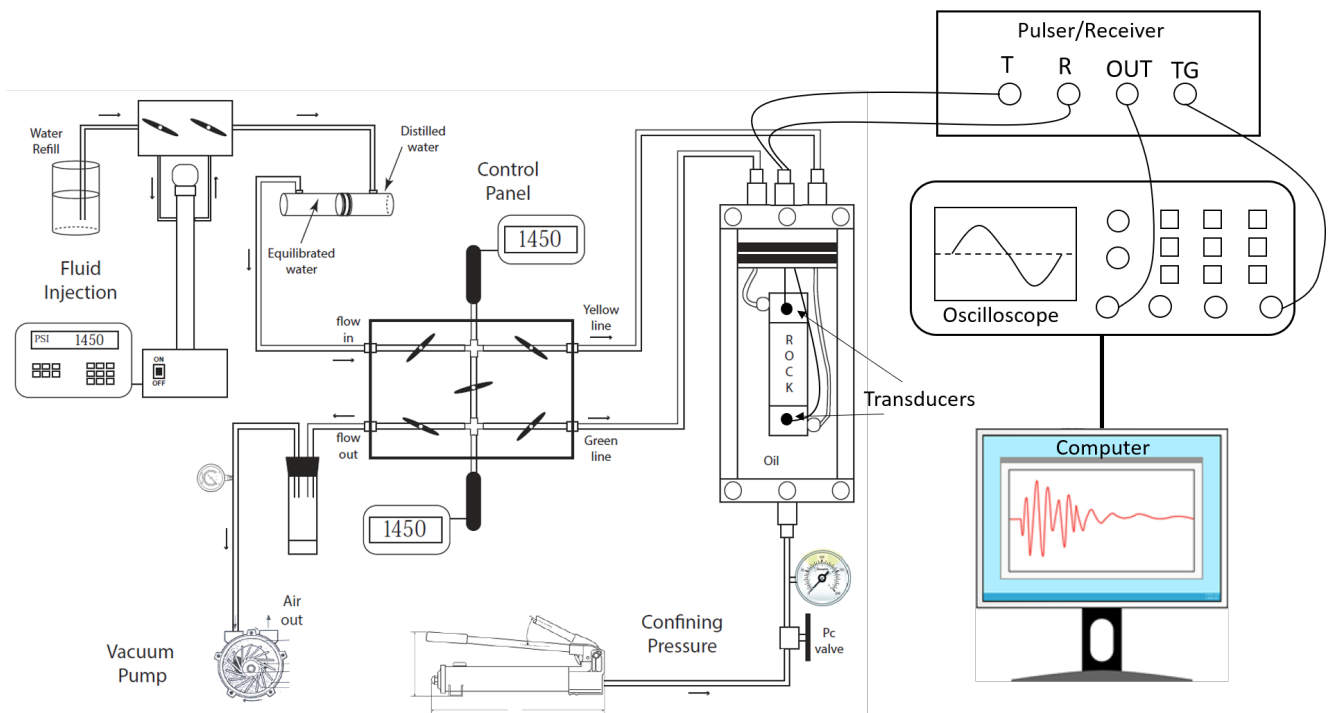


Figure S2: Laboratory setup for ultrasonic measurements at effective pressures modified from Duran [2018]. T: Transmitter. R: Receiver. TG: Trigger.

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