Towards a methodology for use of sonic and ultrasonic tests in earthen materials

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Abstract. In many regions around the world, earth has been used through History as a traditional building material. Nowadays, there is a significant revival of its use due to its ecological value and architectural performance. However, there is still a significant lack of knowledge about its actual mechanical properties and behavior. This work aims at the development of consistent methodologies for the characterization of this building material based on non-destructive tests, NDT's. Ultrasonic and sonic tests on prismatic rammed earth specimens and adobe bricks were carried out. The paper presents an optimized method for estimating S-waves and P-waves based on direct and indirect non-conventional sonic testing methods. Finally, the paper discusses methodological issues for estimating the materials elastic moduli through the propagation velocity of sonic waves.

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