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# Assessment of asphalt mixtures characteristics through GPR testing

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Road pavements are composed by granular and asphalt layers, placed over the pavement subgrade, which are designed to resist to traffic and climatic effects. Pavement distresses include permanent deformation mainly due to the contribution of the subgrade and fatigue cracking in the asphalt layers. Fatigue cracking is the main pavement distress and is responsible for the main rehabilitations carried out in road pavements which leads, in most cases, to the pavement reconstruction due to the severity of the cracking observed in many roads.
For a given aggregate gradation, the fatigue cracking resistance is related to the proportions of the components in the asphalt mixtures, namely the void content and the binder content. Also the presence of water, or moisture, has an important influence in the fatigue resistance, and its effect is characterized by a reduction in the fatigue cracking resistance.
The characteristics of the asphalt mixtures applied in road pavements can be assessed in laboratory through the testing of cores extracted from the pavement. These cores are extracted some representative section of the pavement, usually equally spaced in the road. Due to the construction process, the representative sections of the pavement don't allow to identify the quality of the whole pavement. Thus, the use of continuous measurement is essential to ensure the perfect assessment of the pavement quality and the use of the GPR assumes a paramount importance.
Thus, this communication presents several GPR tests carried out on pavement slabs produced in laboratory with different void content, binder content and moisture content in order to establish different classifiers that will allow the identification of this condition during regular inspections. Furthermore, tests carried on specimens before and after fatigue tests will allow to calculate similar parameters to estimate the state of conservation of pavements in terms of stiffness and the presence of cracks.

This work is a contribution to COST Action TU1208 "Civil Engineering Applications of Ground Penetrating Radar".