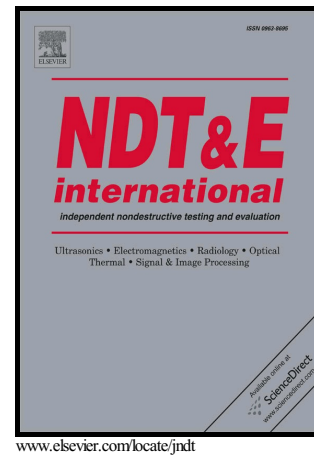


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Determination of concrete rebars characteristics by enhanced post-processing of GPR scan raw data

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Abstract

A method for the estimation of rebar radius by post-processing the raw data acquired by the ground penetrating radar as a B-scan radargram is proposed. Considering the hyperbola trace and the diffracted amplitudes an inverse problem consisting of two steps was stated. Using at first hyperbola fitting, the wave velocity and the coordinates of the hyperbola apex are identified. Then the rebar radius is retrieved as solution of a further optimization problem for which the cost function measures the misfit between the actual value of the maximum diffracted amplitudes and their theoretical predictions. The procedure was implemented in Matlab and tested in realistic situations. The obtained results showed improved accuracy.

Keywords: Ground penetrating radar; Buried rebar; Radius estimation; Localisation; Noise; B-scan; Inverse problem; Optimization.

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