Session 2: Acoustic Emission in Concrete-1

Abstract-8

Acoustic Emission Detection and Evaluation of Crack Opening and Healing by use of Embedded Capsules and Recovery of Cracking Damage in Concrete

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Deterioration of concrete mechanical properties due to cracking phenomena lead to rapid reduction of structural service life. Recently, the propagation of cracking damage is interfered by autonomously sealing the micro-cracks on concrete elements. Encapsulated tubular healing agent is released due to crack opening and provides additional resistance to failure.

A well-established healing system, manufactured by Magnel Laboratory research group, is applied on concrete beams and the mechanical response of damaged and healed cracks is investigated. Fracture analysis on the crack opening (cycle I of loading); crack closure (healing cure); and crack re-opening (cycle II of loading) is done by the use of Acoustic Emission (AE) and Digital Image Correlation (DIC).

Focusing further on the AE features, a full- filed overview of the healing phenomena is performed. In this study, AE characteristics captured on concrete beams under three and four point bending tests are parametrically discussed in detail.