Laboratory validation of corrosion-induced delamination in concrete by ground penetrating radar

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***Abstract*—This paper presents the preliminary findings of a laboratory study on using GPR signal to assess concrete delamination induced by rebar corrosion in reinforced concrete structures. A concrete slab was specially designed to produce horizontal cracking between the rebars by an electrochemical method in the laboratory environment, and the corrosion process is monitored by a 2 GHz ground penetrating radar in a time-lapsed manner. Data analysis include the amplitude change and velocity change of the GPR signal measured from the rebars. Both sets of data show that the amplitude of the reflected signal from the rebars are abnormally high by at least 30% in the corroded areas, whereas the travelling velocity does not show significant differences.**

Keywords*—*delamination; corrosion; ground penetrtaing radar; concrete