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Corrosion of Steel Reinforcement in Concrete: Furthering Knowledge within and beyond Boundaries

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Message from the Guest Editors

Corrosion of steel in reinforced concrete is one of the main contributors to reducing the service life of buildings and civil infrastructure. The complex mechanisms involved in the process of steel reinforcement corrosion are still matter of research, and sometimes subject to erroneous interpretations. One active field is related with the mathematical modelization of both the period of initiation and the period of propagation and damage accumulation due to corrosion. A key area of research is that regarding the prevention of steel reinforcement corrosion and the rehabilitation of structures affected. Especial mention deserves the electrochemical techniques for controlling the corrosion process, like cathodic protection. Interesting research is active on the development of non-destructive techniques for the detection of corrosion and of the damage inflicted to the cementitious composite. The classical electrochemical techniques allow evaluating the damaged areas and the activity of the corrosion process. Other emerging physical techniques, mostly related with the interaction of waves with concrete, allow the early detection of the concrete cover's microcracking.