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REPAIR OF SEVERELY-DAMAGED RC EXTERIOR BEAM-COLUMN JOINTS WITH FRP AND FRCM COMPOSITES

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ABSTRACT: This paper presents the results of an experimental program aimed at comparing the cyclic behavior of three full-scale reinforced concrete (RC) exterior beam-column joints repaired with externally bonded composites. Preliminary, the specimens suffered significant damage, which resulted in a beam-joint (B+J) failure, i.e. shear failure of the panel joint after yielding of longitudinal reinforcement in the beam. The damaged specimens were then repaired using either Fiber Reinforced Polymer (FRP) or Fiber Reinforced Cementitious Matrix (FRCM) composites, and the same loading history was applied to the repaired specimens. The experimental behavior was compared with that of original specimens, and results are presented in terms of load-carrying capacity, stiffness deterioration, ductility, dissipated energy, and equivalent damping viscous ratio. Results allow to clearly identify the contribution of the externally-bonded composites to the overall behavior of the repaired specimens.

Keywords: beam-column joint; cyclic loading; FRP; FRCM; reinforced concrete; seismic repair.

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