Dynamic Complex Modulus of Frpu Composite Strengthening RC Infill Structure – MEZeroE testing

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Abstract:

Fiber Reinforced PolyUrethane (FRPU) is a new technology of structural bonding, dedicated for application in civil engineering, where simultaneous carrying high loads and transferring large deformations is required. A lot of experimental research were carried out on FRPU solutions, proofing its high efficiency as an anti-seismic protection [1, 2, 3] and systems effectively redistributing stress concentrations for protecting brittle structural materials against damage, mainly in composite strengthening [4, 5]. Materials constructing FRPU are of hyperelastic characteristic with visco-elasto-plastic behavior [6]. These aspects make differences in dynamic behavior of FRPU, allowing for efficient reduction of stress concentration and anti-seismic protection.

This work presents results from dynamic tests carried out in frame of H2020 MEZeroE project focusing on determination of dynamic features of the FRPU system in the dominant frequency band of 0.1-10 Hz, dominant for most earthquake excitations. Dynamic complex modulus of the FRPU composite was determined in this frequency band, manifesting significant resistance to dynamic cyclic action, proven by tests on a real scale building protected by FRPU, carried out on a shaking table.

Keywords:

FRPU composite strengthening, dynamic cyclic tests, complex modulus, viscoelastic material.