

An interdisciplinary approach for the experimental assessments of the seismic safety of artworks

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ABSTRACT

Recent seismic events occurred in areas rich of ancient remains and full of cultural and artistic heritage in terms of artworks. Earthquakes may damage buildings, but the vibrations may also induce the uplift and overturning of their content, implying irreparable loss of cultural values. The seismic assessment of objects is general tackled modelling them as rigid blocks. This paper focuses on statues, which generally present a very complicated geometry, and proposes a general methodology involving different disciplines, for their experimental seismic assessment. The methodology is here applied to the masterpiece of “Paolo Orsi” museum in Syracuse (Italy), that is the “Venere di Landolina”. Due to the complexity of statues, traditional techniques cannot be considered reliable for a proper geometry reconstruction; therefore, a TLS and UAS technology is here employed to obtain a highly detailed and complete digital model. Aiming at providing a low cost scaled physical model of the statue, a wooden specimen has been arranged employing a Computer Numerical Control (CNC) machine, cutting off disks from flat panels which are then superimposed and glued, progressively reconstructing the actual geometry of the statue. The specimen, able to approximately reproduce the scaled actual geometry, was then tested on a shaking table with ground motions compatible with those expected for the site where the statue is located. The obtained results are finally correlated with those expected for the real scale statue.