Structural Health Monitoring of existing structures and infrastructures combining on-site and satellite data

Felice Carlo Ponzo and Rocco Ditommaso
University of Basilicata, School of Engineering, Potenza, Italy (felice.ponzo@unibas.it)

In the last years, existing structures and transport infrastructures, especially those made using reinforced concrete, have experienced significant safety criticalities implying also a relevant social and economic impacts. Structural Health Monitoring techniques represent a reliable response to the problem available to scientists and engineers. A multidisciplinary approach combing knowledge from several research fields and using different kind of technologies would be preferable for this type of application. Most of developed methods for structural damage detection on civil structures and infrastructures is generally based on the evaluation of displacements, eigenfrequencies, damping factors, mode shapes, etc., and their variation over time, by means of on-site installed sensors. In recent years, thanks to the rapid evolution of interferometric SAR processing techniques, a large amount of "satellite measurements" are available for both geophysical phenomena and building monitoring in terms of displacement rate over time. This paper presents an overview on the 2019-2021 WP6 Reluis Project aiming to contribute to the discussion about the opportunity and the modalities to merge information retrieved both by on-site and remote sensing measurements and to define a shared strategy to detect damage on existing structures and infrastructures in operational conditions.