

Dynamic identification of the so-called Temple of Minerva Medica: comparison of different instrumentations and methods for mutual validation of the results

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ABSTRACT

Dynamic monitoring is a well consolidated technique used to gain information on the global health of the constructions. In particular, ambient vibration test achieved important results in the dynamic characterization of modal parameters. Several techniques and instrumentations are available nowadays, the mutual validation between different modal analysis techniques is an important procedure to assess the reliability of results. In the present paper the ambient vibration tests performed on the so-called Temple of Minerva Medica in Rome considering different techniques and instrumentations will be described and compared. The Temple of Minerva Medica is a ruined decagonal nymphaeum in opus latericium that dates to the 4th century AD, nowadays the construction is placed in a critical location between the main central train station (Roma Termini) and the local tram way. Several ambient vibration data were acquired during different campaigns [1] to characterize the effects of the vibrations and the modal parameters of the structure. The instrumentation used comprised several seismographs equipped with triaxial velocimeters, piezoelectric and capacitive accelerometers. A variety of techniques were applied to process the acquired vibration data in order to extract the modal parameters of the studied structure including FRF, FDD, EFDD, SSI, HVSR, motion magnification analysis, complex modal models and PolyMAX. The variance of the modal parameters obtained by each different technique was considered to provide indications on the reliability of the average values.

REFERENCES

- [1] Roselli, I., Fioriti, V., Mongelli, M., Bellagamba, I., De Canio, G., 2018, Mutual validation between different modal analysis techniques for dynamic identification of the so-called Temple of Minerva Medica, Rome, in IOP Conf. Series: Materials Science and Engineering, 364, 012004.