Contribution ID: **90** Contribution code: **THP36** Type: **Poster Presentation**

Improvement of structural dynamic stability experimental assessment: principle and actual performance of advanced methods

Thursday 18 September 2025 16:40 (1 hour)

When assessing the stability performance of structures, two figures of merits are required: ground motion transmissibility and mechanical compliance. The former quantifies amplification ofground transmitted vibrations, and the second the displacement induced by on-board disturbance sources. Both must remain sufficiently low to keep structural response within stability requirements. In practice, a direct measurement of these quantities is preferred, since it allows to characterize the structure in real conditions. Still, this method requires the use of specific sensors, which is not always feasible due to practical limitations. Less-than-ideal excitation is also to be expected. As a consequence, actual measurements most often suffer noise contamination. In this article, the authors share their experience with using one promising methods -the so-called PRANK∗ approach- combining both space and frequency Truncated Singular Values Decomposition (TSVD) with Hankel reduction. The method is applied on both transmissibility and compliance quantities, as obtained on one of the key elements for the SOLEIL II project: multipole magnets installed on the girder.

Footnotes

∗ PRANK: a singular value based noise filtering of multiple response datasets for experimental dynamics https://doi.org/10.48550/arXiv.2405.07578

Funding Agency

None

Author: Mr JOBERT, Nicolas (Alma Consulting - Precision Engineering Services)

Co-authors: Mr TRAINOTTI, Francesco (Technical University of Munich); Mr DA SILVA CASTRO, José (Synchrotron soleil); Mr TAVAKOLI, Keihan (Synchrotron soleil); FAN, Zhengxuan (Synchrotron soleil)

Presenters: Mr JOBERT, Nicolas (Alma Consulting - Precision Engineering Services); FAN, Zhengxuan (Synchrotron soleil)

Session Classification: Thursday Poster Session

Track Classification: PRECISION MECHANICS: Stability Issues