Deliverable 7.4

D7.4 Testing center software codes for high-density testing of non-linear ground-motion models and high-resolution exposure/risk models

Deliverable information	
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Summary

This deliverable, together with Deliverable D7.5, is mainly associated with the task T7.4 of Work Package 7 and has been hampered strongly by the canceled deployment of low-cost sensors (due to the international chip crisis) in the test areas as were planned in the proposal. For the investigation of high-resolution ground-motion models (GMM), an experiment in the Valais, Switzerland, area was planned in order to cover the sedimentary basin and the mountain slopes on each side of the valley with instruments. Measurements in such an environment would have provided the necessary high-resolution recordings for the envisioned study.

The work on the deliverables 7.4/7.5 was affected by this lack of data and sensors. Nonetheless, the report provides the test codes for testing an important component of ground-motion models, namely non-linear amplification modules. The authors conclude on the basis of their test that linear amplification modules are satisfactory and frequently outperformed the more complicated non-linear models, and they acknowledged that additional measures of non-linearity should be investigated next. For this work, we teamed up with the URBASIS project (see Acknowledgments).

Codes

All codes were developed in Python and use libraries provided in R. The `README.md` file in the repository guides the user through the installation process. The user needs to download the dataset from Bahrampouri et al. (2020)[1] and the model coefficients from the non-linear site amplification models of Seyhan and Stewart (2014)[2] and Abrahamon et al. (2014)[3]. The use of the codes has been made easy by providing a fully documented Python Jupyter notebook that guides the user through the test process.

The testing codes and the Jupyter notebook for non-linear ground models can be obtained at:

`https://git.gfz-potsdam.de/karinalo/test_nl_siteampmodel`

The codes are also available from Zenodo:

`https://zenodo.org/record/6299826`

with the DOI:

10.5281/zenodo.6299826

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1https://doi.org/10.17603/ds2-e0ts-c070

2https://journals.sagepub.com/doi/suppl/10.1193/063013EQS181M

3https://journals.sagepub.com/doi/suppl/10.1193/070913EQS198M

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