Seismo-Live: Training in Seismology with Jupyter Notebooks

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Seismological training tends to occur within the isolation of a particular institution with a limited set of tools (codes, libraries) that are often not transferrable outside. Here, we propose to overcome these limitations with a community-driven library of Jupyter notebooks dedicated to training on any aspect of seismology for purposes of education and outreach, on-site or archived tutorials for codes, classroom instruction, and research. A Jupyter notebook (jupyter.org) is an open-source interactive computational environment that allows combining code execution, rich text, mathematics, and plotting. It can be considered a platform that supports reproducible research, as all inputs and outputs may be stored. Text, external graphics, equations can be handled using Markdown (incl. LaTeX) format. Jupyter notebooks are driven by standard web browsers, can be easily exchanged in text format, or converted to other documents (e.g. PDF, slide shows). They provide an ideal format for practical training in seismology. A pilot-platform was setup with a dedicated server such that the Jupyter notebooks can be run in any browser (PC, notepad, smartphone). We show the functionalities of the Seismo-Live platform with examples from computational seismology, seismic data access and processing using the ObsPy library, seismic inverse problems, and others. The current examples are all using the Python programming language but any free language can be used. Potentially, such community platforms could be integrated with the EPOS-IT infrastructure and extended to other fields of Earth sciences.