



Seismic Software Evaluation at the Swiss Seismological Service

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The Swiss Seismological Service (SED) has an ongoing responsibility to improve the seismic monitoring capability for Switzerland. This is a crucial issue for a country with a low background seismicity but where a large M6+ earthquake is expected in the next decades. With over 30 stations and station spacing of ~ 25 km, the SED operate one of the densest broadband networks in the world, which is complimented by a similar number of real time strong motion stations. An existing in-house processing software has been operational for the last 15 years, and though well suited for the Swiss setting, including the ability to 1. automatically locate and alert local events and 2. manually relocate events with a nonlinear location algorithm using a 3-D velocity model, the software does not satisfactorily accommodate integration of standard community software tools, nor provide a modern database interface for either station metadata or event parameters. To take advantage of major improvements in software architecture and community tools, we wish to migrate to a community standard solution for data acquisition, automatic and manual processing, and archival. We have been evaluating in detail SeisComp3, a state-of-the-art monitoring system developed by GFZ, as well as Nanometrics Apollo Suite (which uses USGS Hydra at it core for event processing). We present our analysis of the capabilities of each software we have been evaluating. In particular, we focus on the capability of each software to detect and identify small local ($>M1.1$) as well as large regional events. We discuss our results in terms of location and magnitude accuracy, with particular attention to the specific improvements needed from monitoring systems for improved monitoring of small regions with high quality seismic networks.