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Combining Broadband, Strong Motion, and other geophysical data in real time data acquisition and processing at the Swiss Seismological Service SED

J. Clinton (1), F. Haslinger (1), D. Fäh (1), P. Zweifel (1), O. Schnabel (2), and D. Giardini (1)

(1) ETH Zürich, Schweizerischer Erdbebendienst, Zürich, Switzerland (haslinger@sed.ethz.ch, 004144 633 1065), (2) ETH Zürich, Institut für Kartographie, Zürich, Switzerland

The Swiss Seismological Service (SED) operates one of the densest seismic broadband networks in Europe with 27 STS2 stations transmitting 24 bit 120sps data in real time. In addition the SED operates a network of 77 strong-motion recorders (65 free-field, 12 on hard rock co-located with broadband sensors). At 16 of the free-field sites and the 12 hard-rock sites Episensor accelerometers and 24 bit digitizers are installed and data is also transmitted in real time, while the other stations are equipped with 1990-era Geosig strong motion sensors, 16 bit A/D converters, and dial-up telephone links. Over the next 10years it is planned to replace those older strong motion stations with Episensors, 24 bit digitizers, and real-time data links, and to install an additional 51 free-field stations of that type.

Past experience has shown that the strong motion data is very useful for refining the hypocentral parameters especially for smaller earthquakes, so in future all new strong motion channels will be integrated into the real-time processing.According to the SED open data policy all this data will be freely available e.g. through ORFEUS.

Furthermore, new regional experiments in Switzerland (in particular COGEAR, "Coupled seismogenic Geohazards in Alpine Regions") will provide additional data from dense temporary deployments of strong motion stations and real-time GPS, but also from other geophysical methods like geochemical and magnetotelluric measurements with significantly different data types and sampling rates.

Apart from the challenges of integrated acquisition and quasi-real-time processing of all that data the provision of efficient access to data streams and station metadata requires new concepts of web-based data visualisation and retrieval implementations (e.g. webmap services).