



Scientific goals of SCHOOLS & QUAKES

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In many countries around the world seismometers are used in schools to broaden the knowledge in seismology in a vivid way and to take part in the observation of the current worldwide seismic activity. SCHOOLS & QUAKES is a project within the Sparkling Science program (<http://www.sparklingsscience.at>), which not only pursues the given educational goals but also integrates scholars in seismological research permitting their own contributions. Research within SCHOOLS & QUAKES concentrates on the seismic activity of the Mürz Valley – Semmering - Vienna Basin transfer fault system in Austria because of its relatively high earthquake hazard and risk. The detection of low magnitude local earthquakes (magnitude ≤ 2), precise location of hypocenters, determination of the focal mechanisms, and correlation of hypocenters with active geological structures are the main scientific goals in this project. Furthermore, the long term build-up of tectonic stress, slip deficit and aseismic slip, and the maximum credible earthquake in this area are issues to be addressed.

The scientific efforts of SCHOOLS & QUAKES build on the work of the Seismological Service of Austria at the Zentralanstalt für Meteorologie und Geodynamik (ZAMG), and benefit from the findings on the lithospheric structure of the Eastern Alps gained by the CELEBRATION 2000 and ALP 2002 projects. Regional Vp and Vs-models were derived from this data covering the SCHOOLS & QUAKES target area. Within the ALPAACT project (Seismological and geodetic monitoring of ALpine-PAnnonian Active Tectonics) the seismic network of the target area was densified by 7 broadband und 2 short period stations. Relocations based on a 3D-velocity model and the densified seismic network yielded substantially higher spatial resolution of seismically active structures. A new method based on waveform stacking (GRA, 16, EGU2014-5722) allowed for focal mechanism solutions of low magnitude ($M_l \sim 2.5$) events. Data from 22 GNSS stations have been reprocessed and yield continuous time series since 2008. The research within SCHOOLS & QUAKES is a consequent continuation of the ALPAACT initiatives. It is coordinated with the ZAMG efforts to keep the routine seismological work on a high scientific standard. Three polytechnic schools in Vienna and the southern Vienna Basin (Mödling and Wiener Neustadt) take part in SCHOOLS & QUAKES. So-called school seismometers as well as high performance short period stations have been installed at these locations. In addition to routine maintenance and site optimization of the seismic stations, scholars and teachers of these schools contribute to research by their unprejudiced approach to interactive event detection and travel time picking as well as by their expertise in electronics, informatics, and civil engineering. The development of low cost short period stations which meet the requirements of medium to high noise locations, or the generation of shake maps and their conversion into maps of potential source locations are work in progress in cooperation with graduate students.