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The Self-Organising Seismic Early Warning Information Network: Scenarios

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The Self-Organising Seismic Early Warning Information Network (SOSEWIN) represents a new approach for Earthquake Early Warning Systems (EEWS), consisting in taking advantage of novel wireless communications technologies without the need of a planned, centralised infrastructure. It also sets out to overcome problems of insufficient node density, which typically affects present existing early warning systems, by having the SOSEWIN seismological sensing units being comprised of low-cost components (generally bought "off-the-shelf"), with each unit initially costing 100's of Euros, in contrast to 1,000's to 10,000's for standard seismological stations. The reduced sensitivity of the new sensing units arising from the use of lower-cost components will be compensated by the network's density, which in the future is expected to number 100's to 1000's over areas served currently by the order of 10's of standard stations. The robustness, independence of infrastructure, spontaneous extensibility due to a self-healing/self-organizing character in the case of removing/failing or adding sensors makes SOSEWIN potentially useful for various use cases, e.g. monitoring of building structures or seismic microzonation.
Nevertheless its main purpose is the earthquake early warning, for which reason the ground motion is continuously monitored by conventional accelerometers (3-component). It uses SEEDLink to store and provide access to the sensor data.
SOSEWIN considers also the needs of earthquake task forces, which want to set-up a temporary seismic network rapidly and with light-weighted stations to record after-shocks. The wireless and self-organising character of this sensor network should be of great value to do this job in a shorter time and with less manpower compared to using common seismic stations.
We present here the graphical front-end of SOSEWIN in its usage for different scenarios. It belongs to a management infrastructure based on GIS and database technologies and therefore coupling with existing infrastructures should be simplified.
Connecting the domain expert's laptop running the management software with a SOSEWIN may be fulfilled via any arbitrary node in the network (on-site access) or via a gateway node from a remote location using the internet. The scenarios focus on the needs of certain domain experts (seismologists or maybe engineers) and include the planning of a network installation, support during the installation process and testing of this installation. Another scenario mentions monitoring aspects of an already installed network and finally a scenario deals with the visualization of the alarming protocol detecting an earthquake event and issuing an early warning.