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Windrum: a program for monitoring seismic signals in real time

Flora Giudicepietro
Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Vesuviano, Napoli, Italy (flora.giudicepietro@ingv.it)

Windrum is a program devote to monitor seismic signals arriving from remote stations in real time. Since 2000, the Osservatorio Vesuviano (INGV) uses the first version of Windrum to monitor the seismic activity of Mt. Vesuvius, Campi Flegrei, Ischia and Stromboli volcano. The program has been also used at the Observatory of Bukittinggi (Indonesia), at the offices of the Italian National Civil Protection, at the COA in Stromboli and at the Civil Protection Center of the municipality of Pozzuoli (Napoli, Italy). In addition, the Osservatorio Vesuviano regularly uses Windrum in educational events such as the Festival of Science in Genova (Italy), FuturoRemoto and other events organized by Città della Scienza in Naples (Italy). The program displays the seismic trace of one station on a monitor, using short packet of data (typically 1 or 2 seconds) received through UTC Internet protocol. The data packets are in Trace_buffer format, a native protocol of Earthworm seismic system that is widely used for the data transmission on Internet. Windrum allows the user to visualize 24 hours of signals, to zoom selected windows of data, in order to estimate the duration Magnitude (Md) of an earthquake, in an intercative way, and to generate graphic images for the web. Moreover, Windrum can exchange Internet messages with other copies of the same program to synchronize actions, such as to zoom the same window of data or mark the beginning of an earthquake on all active monitors simultaneously. Originally, in 2000, Windrum was developed in VB6. I have now developed a new version in VB.net, which goes beyond the obsolescence problems that were appearing. The new version supports the decoding of binary packets received by soket in a more flexible way, allowing the generation of graphic images in different formats. In addition, the new version allows a more flexible layout configuration, suitable for use on large screens with high resolution. Over the past 17 years the use of Windrum for visual analysis of the seismic signals of Vesuvius, Campi Flegrei, Ischia and Stromboli has reduced the detection threshold of the events, allowing a detailed analysis of the seismogram in near real time.