Advances in earthquake-swarms monitoring networks WEBNET and REYKJANET

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The IG CAS in cooperation with IRSM CAS operates two local seismic networks deployed to monitor the seismic swarms in West Bohemia/Vogtland, Czechia and Reykjanes Peninsula, Iceland.

WEBNET monitors the region of West Bohemia since 1991 developing from 4 short period stations to 24 broadband stations today. The seismoactive region West Bohemia/Vogtland lies in the border area between Czechia and Germany in the western part of Bohemian Massif. It is an intra-continental area with persistent swarm-like seismicity but rarely also main-shock after-shock sequences may occur.

REYKJANET local seismic network is situated in Reykjanes Peninsula on Southwest Iceland. The area is an onshore part of the mid-Atlantic plate boundary between the North America and Eurasia Plates. The seismic activity of Reykjanes peninsula is represented by typical main-shock after-shock sequences as well as earthquake swarms. The REYKJANET network was built in 2013 and it consists of 15 stations placed around the epicentral area.

Both networks have been substantially upgraded during the last years. In case of REYKJANET the replacement of old sensors and digitizers with new ones made the operation easier and ready for near future plan to stream the waveform files in real time. WEBNET network which was long years divided into two subnets - on-line permanent stations and off-line autonomous stations, was recently homogenized by eco-powering and 4G LTE data connecting of the off-line stations. Additionally, the micro network HORNET was deployed within the WEBNET epicentral zone to monitor Horka water dam.

Data from both above mentioned networks are automatically searched for seismic events by the neural-network-based detector designed by Doubravová et al. (2016, 2019) providing event list with completeness magnitude Mc=0 for REYKJANET and Mc=-0.5 for WEBNET. The main difference of sensitivity is given by different noise levels of the two networks.