

A REVISION OF THE CUMULATIVE ABSOLUTE VELOCITY (CAV) THRESHOLD LEVEL VALUES FOR VRANCEA EARTHQUAKES

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Strong earthquakes in the Romanian Vrancea area have caused a high toll of casualties and extensive damage over the last several centuries. With a moment magnitude of 7.4, the last strong Vrancea earthquake on March 4, 1977 caused more than 1500 casualties, the majority of them in Bucharest. Strong earthquakes in the Vrancea zone occur between 60-200 km depth within an almost vertical column. Bucharest Earthquake Early Warning (EEW) system detects earthquakes with a seismic network in the epicentral Vrancea region and issue a warning in Bucharest providing 20-25s warning time.

To enhance EEW capability and to decrease the effects of Vrancea earthquakes on the populated cities for Romania, in particular on Bucharest city, the relationships of the bracketed cumulative absolute velocity window (BCAV-W) approach versus epicentral distance and magnitude for Vrancea region were investigated, in 2013, within the scope of the *Network of European Research Infrastructures for Earthquake Risk Assessment and Mitigation* (NERA) project. With in the context of this study the rational threshold levels related to $M_w=5.4+$ earthquakes were given as 0.28 m/s and 0.34 m/s.

To advance the actual EEW capability further, in this study, the number of previously used data has been increased with few earthquakes $M5+$ and a dataset of about 150 acceleration records which consists of intermediate depth earthquakes with different magnitudes ($4.0M_w6.0$) and with epicentral distances of less than 200 km has been used. BCAV-W approach versus epicentral distance and magnitude for Vrancea region have been reinvestigated.

In conclude, new rational threshold levels related to $M_w=5.6+$ earthquakes have been determined as 0.28 m/s, 0.36 m/s and 0.48 m/s related to 8-second, 12-second and 16-second windows, respectively.

Keywords: Earthquake Early Warning, Cumulative Absolute Velocity