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# TESTING THE QUICK SEISMIC EVENT LOCATOR and MAGNITUDE CALCULATOR (SSL_Calc) BY MARSITE PROJECT DATA BASE

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Locating and calculating size of the seismic events is quickly one of the most important and challenging issue in especially real time seismology. In this study, we developed a Matlab application to locate seismic events and calculate their magnitudes (Local Magnitude and empirical Moment Magnitude) using single station called SSL_Calc. This newly developed sSoftware has been tested on the all stations of the Marsite project “New Directions in Seismic Hazard Assessment through Focused Earth Observation in the Marmara Supersite-MARsite”.

SSL_Calc algorithm is suitable both for velocity and acceleration sensors. Data has to be in GCF (Güralp Compressed Format). Online or offline data can be selected in SCREAM software (belongs to Guralp Systems Limited) and transferred to SSL_Calc. To locate event P and S wave picks have to be marked by using SSL_Calc window manually. During magnitude calculation, instrument correction has been removed and converted to real displacement in millimeter. Then the displacement data is converted to Wood Anderson Seismometer output by using; Z=[0;0]; P=[-6.28+4.71j; -6.28-4.71j]; A0=[2080] parameters. For Local Magnitude calculation,; maximum displacement amplitude (A) and distance (dist) are used in formula (1) for distances up to 200km and formula (2) for more than 200km.

ML=log10(A)-(-1.118-0.0647*dist+0.00071*dist2-3.39E-6*dist3+5.71e-9*dist4) (1)
ML=log10(A)+(2.1173+0.0082*dist-0.0000059628*dist2) (2)

Following Local Magnitude calculation, the programcode calculates two empiric Moment Magnitudes using formulas (3) Akkar et al. (2010) and (4) Ulusay et al. (2004).

Mw=0.953* ML+0.422 (3)
Mw=0.7768* ML+1.5921 (4)

SSL_Calc is a software that is easy to implement and user friendly and offers practical solution to individual users to location of event and ML, Mw calculation.