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Data Center Magnitudes and Their Relation to International Seismological Center Magnitudes Using Data for Ethiopia and Eritrea Regions

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Various type of magnitude scales are recognized for estimating the earthquakes size. Magnitude is one of the significant factors for a unified earthquakes catalog which is needed for seismic hazard assessment and disaster management. The variation in magnitude value from seismological agency to other stimulated the researchers to study the regression relationship between the magnitudes. The study area is located between latitudes 4° - 16° and Longitudes 36° - 42° in the east Africa region. A selected number of events which has magnitudes ranges from 3 to 5.6 for the period between 2000 and 2020 were used to create the regression relations. In this research the standard least-square regression (SR) and orthogonal regression (OR) were derived to assess the relation between the international data center (IDC) magnitudes in addition to the international data center (ISC) magnitudes based on body wave magnitude (mb), surface wave magnitude (MS) and local magnitudes, these regressions were adopted to choose the best regression model. Finally, the conversion equations between magnitudes were constructed and determined for wide range about twenty years.

Promotional text

The objective of this study is to derive relation between IDC magnitudes to help when it becomes difficult to read any type of magnitude and to find relations between IDC and ISC magnitudes to solve any problem in magnitudes for the same events in case of missing or unclear data.

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