Relationships among Magnitudes and Seismic Moment of Earthquakes in the Taiwan Region

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ABSTRACT

The seismic moments (M_o), body-wave magnitudes (m_b), and surface-wave magnitudes (M_s) of 201 Taiwan earthquakes with $4.8 \le m_b \le 6.6$ published in the Global CMT catalog from 1976 to 2006 are used to study the correlations among the three source parameters. The resultant relationships are: $\log(M_o)=(1.07\pm0.04)M_s+(18.72\pm0.20)$; $\log(M_o)=(1.73\pm0.09)m_b+(15.09\pm0.52)$; and $M_s = (1.46\pm0.08)m_b-(2.52\pm0.43)$. The three relationships have high agreement with those of earthquakes in the circum-Pacific seismic belt. This might imply that the tectonic condition and source properties of the Taiwan region behave like the average ones of the circum-Pacific seismic belt.