

Toward Consistent Earthquake Magnitude Estimates – From all Seismic Phases

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Magnitudes were intended to be a measure of seismic event energy. But M_b , M_s , M_L etc. do not necessarily give us the same value for ‘energy’. These magnitude values can vary by as much as 1 – 1.5 m_u . To resolve this differential the relative energy levels for the various phases are estimated, relative magnitudes computed and the results compared for both strike-slip and thrust/normal faulting. Amplitude data from the International Seismological Centre bulletins for earthquakes from the western United States, Iran and Europe are analyzed for their relative energy content and the effects of source mechanisms on their ‘magnitude’ estimates for Pg, Lg, Pn, Sn, P, S, P’, and Rayleigh waves. Reliability estimates and the effects of station corrections are also evaluated.

Dr. Veith received a BS and MS in Geophysics from the University of Minnesota and a PhD in Geophysics from Southern Methodist University. He has over fifty years of experience, primarily in the field of arms control verification research.