Attenuation of coda waves in the North Eastern Region of India

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Coda wave attenuation quality factor Qc are estimated in the Northeastern region of India using 45 local earthquakes recorded by regional seismic network. The quality factor Qc was estimated using the single backscattering model modified by Sato (1977), in the frequency ranges 1 - 18 Hz. A total of 3890 Qc measurements covering 187 varying paths were made. Eight lapse time windows of 20, 30, 40, 50, 60, 70, 80 and 90 sec are used. The magnitudes of the analyzed events range from 1.2 to 3.9 and focal depths range between 7 and 38 km. The source receiver distances of the selected events range between 16 and 270 km. For 30 sec coda window length, the mean values of the estimated Qc vary from 50+12 (at 1Hz) to 2078+211(at 18Hz) for the Arunachal Himalaya, 49+14 (at 1Hz) to 2466+197 (at 18Hz) the Indo Burman and 45+13 (at 1Hz) to 2069+198 (at 18Hz) for Shillong group of earthquakes. The Qc increases with frequency; an average attenuation relation Qc = 52.315+1.07f (1.32+0.036) is obtained for the region. The pattern of Qc-1 with frequency is analogous to the estimates obtained in other tectonic areas in the world, except with the observation that the Qc-1 is much higher at 1Hz for NER. The Qc-1 is about 10-1.8 at 1Hz and decreases to about 10-3.6 at 18Hz indicating clear frequency dependence. The spatial distribution of Qc values indicates that Mikir Hills, Arunachal Himalaya and western part of Shillong Plateau are characterized by lower attenuation.