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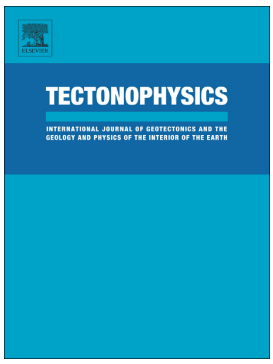

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ACCEPTED MANUSCRIPT

Regional variation of Coda *Q* in Kopili fault zone of northeast India and its implications

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Abstract

Kopili fault has been experiencing higher seismic and tectonic activity during the recent years. These kind of active tectonics can be inspected by examining coda-wave attenuation and its dependence with frequency. Exploiting single back-scattering model, we have endeavored to measure coda Q and its associated parameters such as frequency dependent factor (n) and attenuation coefficient (γ) covering seven lapse-time windows spanning from 30 to 90 sec and central frequencies 1.5, 3.5, 6, 9 and 12 Hz. The average estimated values of Q_C increases with frequency and lapse time window from 114 at frequency 1.5Hz to 1563 at frequency 12Hz for 30sec window length, and from 305 at frequency 1.5Hz to 2135 at frequency 12Hz for 90sec window length. The values of Q_0 and n are also estimated for the entire Kopili fault zone. For this study region, the Q_0 values vary from 62 to 348 and n varies from 0.57 to 1.51 within the frequency range 1.5 to 12 Hz. Furthermore, depth variation of attenuation of this region reveals that there is velocity anomaly at depth 210-220 km as there arises sharp changes in γ and n which are supported by available data, reported by other researcher for this region. Finally, we have tried to separate the intrinsic and scattering attenuation for this area. It is observed that the entire region is dominated by mainly scattering attenuation, but we can see an increase in intrinsic attenuation with depths in two stations namely TZR and BKD. Furthermore, the obtained results are comparable with the available global data.

Keywords: Coda-wave; Wave propagation; Frequency dependency; Seismic Attenuation; Crustal Properties.

1. Introduction

The energy of seismic wave at various distances from earthquake source is severely affected by geological medium. Attenuation is one of the vital parameters that characterizes the

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