

and Temporal Variations in Coda Q Attenuation of Seismic Waves in the Lower St. Lawrence Region, Southeastern Canada

Tuesday 20 June 2023 11:00 (1 minute)

We investigated seismic attenuation characteristics of the Lower St. Lawrence seismic zone. This zone is located ~400 km downstream from Quebec City and is between the Quebec North Shore and the Lower St. Lawrence. Coda Q was determined using 847 earthquakes ($2.0 \leq M \leq 5.1$) recorded on ten stations of the Canadian National Seismic Network (CNSN) in Quebec from 1985 to 2022. We find that the lowest overall average of Q_0 (Q at 1 Hz) values are at the three stations (GSQ, ICQ and SMQ) within 100 km of a moderate earthquake of m_N 5.1 in 1999 (e.g., Q_0 of 81, 88 and 80, respectively). We determined temporal variations in attenuation following the 1999 earthquake. The overall average of Q_0 decreased from 87 (before the mainshock) to 77 (GSQ), from 92 to 85 (ICQ) and from 88 to 82 (SMQ). These results are in agreement with global studies that show a decrease in Q_0 following a major earthquake, likely the result of increased fracturing and fluids in the epicentral region. An average for all the data results in a Q relationship of $Q_C = 86f^{1.07}$ for the frequency band of 2 to 16 Hz for the entire region.

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Promotional text

Our presentation provides an overall knowledge about coda Q in a region in southeastern Canada which is one of the most useful parameters for the study of earth structure and seismic hazard assessments.

Oral preference format

in-person

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