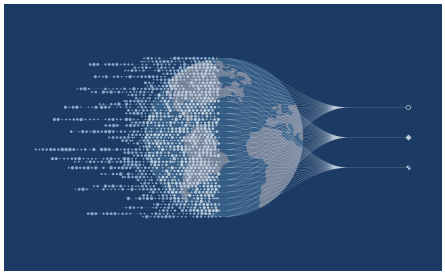

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Assessing the impact of urbanization-induced cultural noise on seismic monitoring: a case study of AS118

Thursday 11 September 2025 11:00 (1 hour)

Continuous monitoring of environmental and cultural noise levels is critical in selecting and maintaining seismic station sites, especially in regions undergoing rapid urbanisation. Cultural noise is of particular concern for stations near densely populated or industrialising areas, where human activities generate vibrations that interfere with detecting and analysing seismic signals. This paper examines the increasing levels of cultural noise affecting the CTBTO's AS118, as urban expansion and infrastructure development increase background noise levels. Using ambient noise analysis and time series data from the AS118 station, we assess the impact of cultural noise on seismic data integrity and explore mitigation strategies to preserve signal quality. Methodologies for noise filtering and spatial analysis, as proposed by Petronio (2016), were implemented to evaluate the feasibility of isolating seismic events in the presence of high cultural noise. Furthermore, this study incorporates a comparative approach by investigating similar stations located in urbanising environments, following the methodologies proposed by McNamara and Buland (2004). Our findings underscore the importance of ongoing noise assessments to ensure the functionality of seismic monitoring systems in urban areas. The results provide critical insights that could be adapted for other CTBTO stations facing similar challenges worldwide, and that may require relocation.

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