Pre- and post-lockdown noise levels during Covid-19 pandemic

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Summary:

During the COVID-19 pandemic, a study was conducted to compare the seismic noise levels before and during the lockdown period. The study focused on utilizing probabilistic power spectral density as a method of comparison. Four seismic stations located in Kolkata, India; Paris, France; Berlin, Germany; and New York, USA, were chosen for the analysis.

The findings of the study revealed a significant difference in seismic noise levels between the pre-lockdown and lockdown periods. Interestingly, the magnitude of this difference varied across the selected locations. Kolkata exhibited the highest disparity in seismic noise levels, followed by Paris, Berlin, and New York, in descending order.

Methodology:

The study employed probabilistic power spectral density as the primary method for comparing seismic noise levels. This method allowed for a comprehensive analysis of the frequency content and amplitude distribution of seismic signals recorded at each station. By calculating power spectral densities for both pre-lockdown and lockdown periods, we were able to quantitatively assess the variations in seismic noise over time.

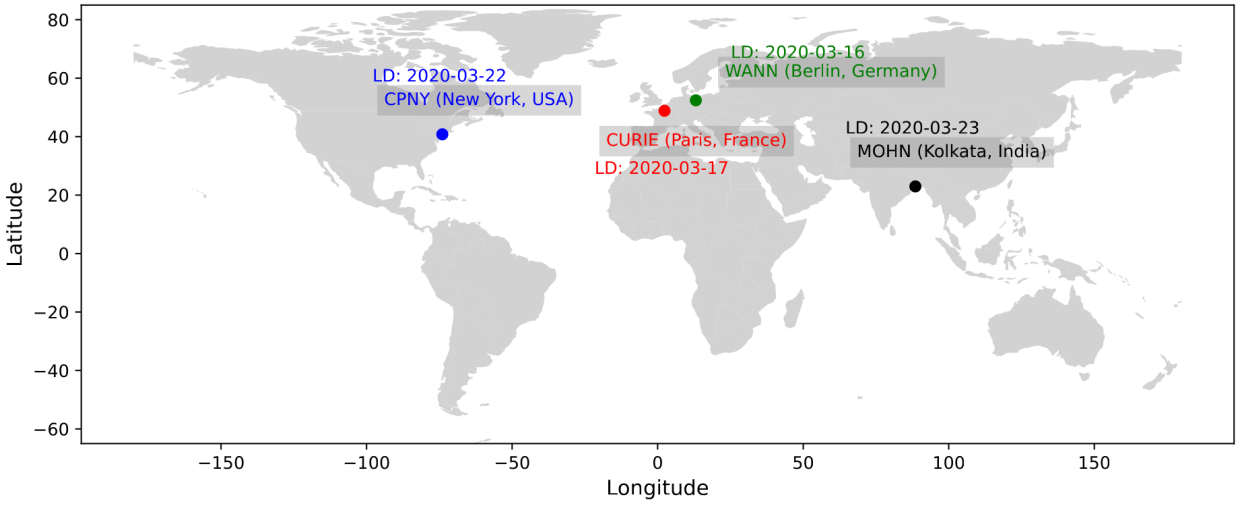
Findings:

1. Significant Difference: The comparison revealed a notable difference in seismic noise levels between the pre-lockdown and lockdown periods across all selected locations.

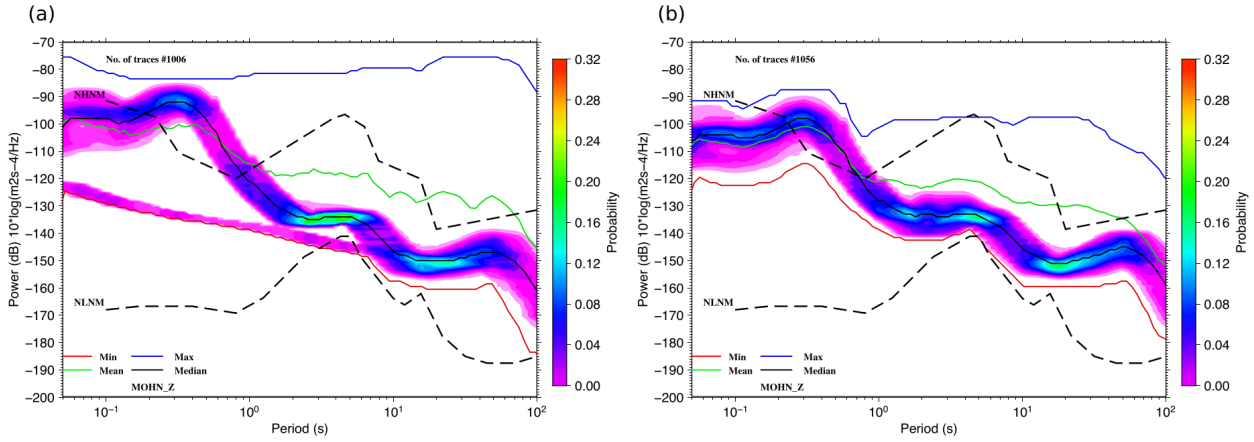
2. Location-Specific Disparities: The magnitude of difference in seismic noise varied among the studied locations, with Kolkata exhibiting the highest contrast, followed by Paris, Berlin, and New York.
3. Implications: These findings underscore the impact of human activities, particularly during the lockdown period, on seismic noise levels. Understanding such variations can contribute to improved seismic monitoring and interpretation efforts.

In conclusion, the study highlights the utility of probabilistic power spectral density analysis in assessing seismic noise variations during exceptional events like the COVID-19 pandemic. The observed differences in seismic noise levels emphasize the need for further research into the influence of anthropogenic factors on seismic signals and their implications for seismological studies.

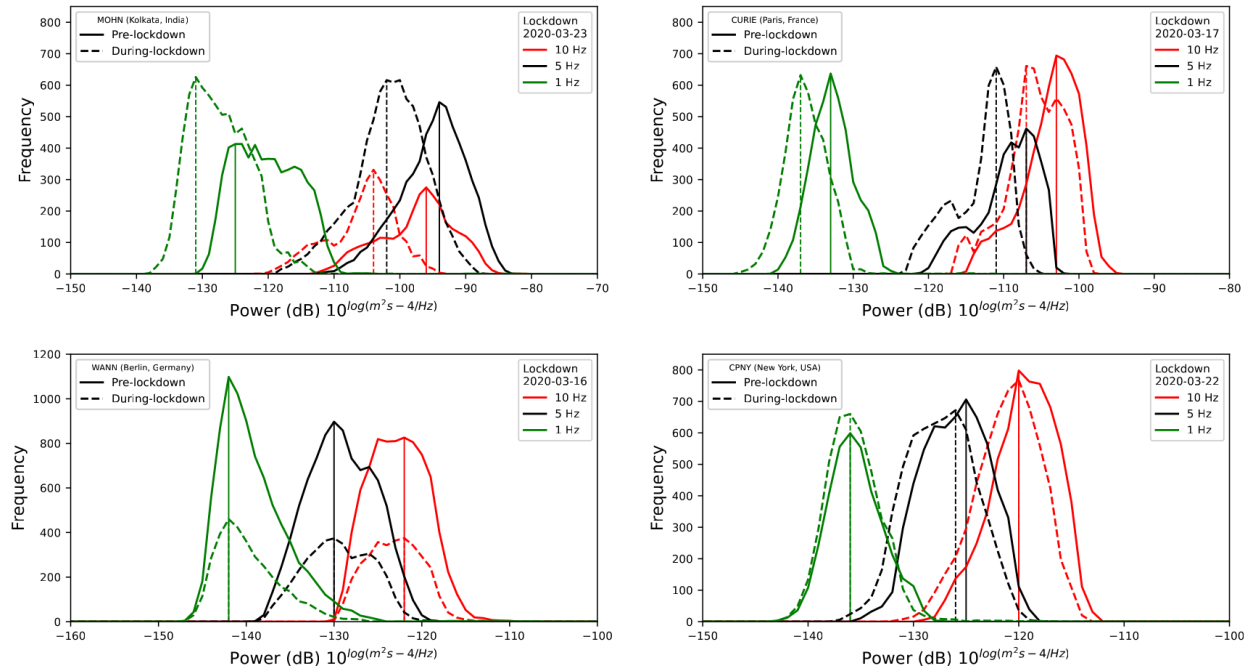
- Station Locations



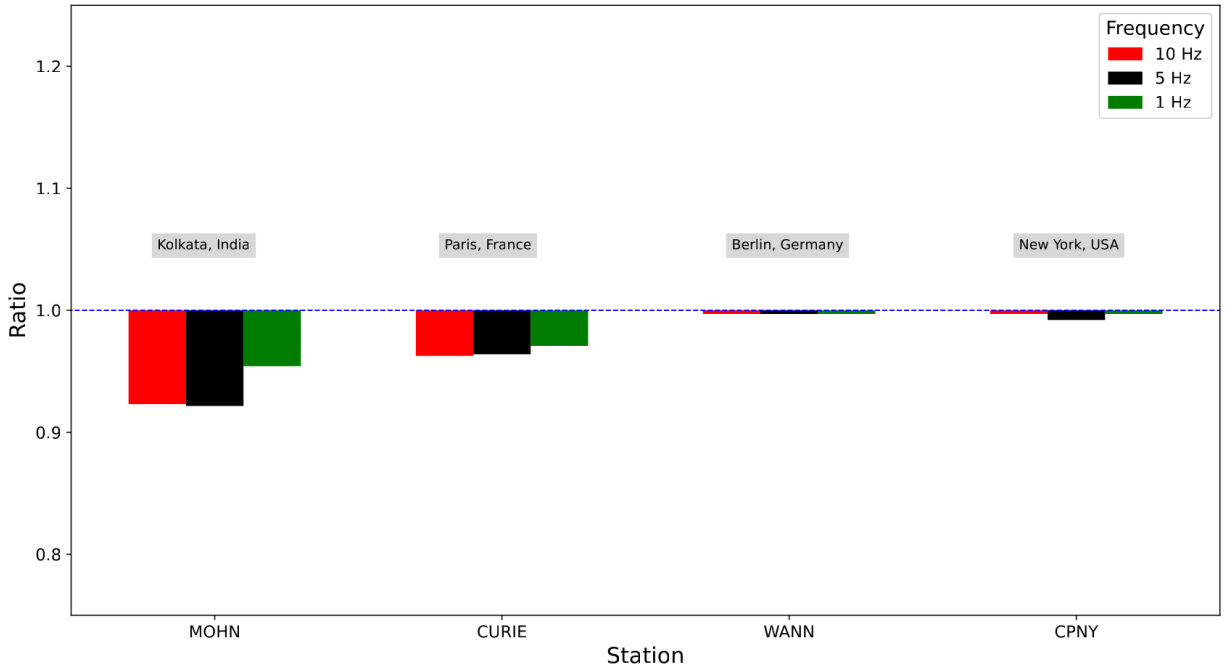
- Probabilistic Power Spectral Densities example for MOHN station in Kolkata, India



- Noise reduction plots for all four stations



- Pre- and Post- Lockdown noise ratio



Note: Link for High Definition figures

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