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Time Global Assessment of Tsunami Risks Using Acoustic Gravity Waves

This study presents a real time technology for detecting and classifying geophysical events using acoustic signals. Initially developed for tsunami monitoring, the system integrates advanced computational models and machine learning algorithms to process acoustic data and extract event characteristics, including location, magnitude and fault dynamics [1]. The methodology facilitates real time mapping of risk areas and event trajectories, providing timely insights critical for effective response strategies. Validation against historical events demonstrates robust performance, with global scale analyses completed within seconds on standard multi-core machines. An additional feature of this technology is its potential applicability to a wider range of geophysical events, such as underwater explosions and other seismic activities. Its flexibility positions it as a complementary tool for existing warning frameworks, with possible relevance for organizations like the Comprehensive Nuclear-Test-Ban Treaty Organization in future monitoring efforts. By addressing key challenges such as false alarms and response delays, this system contributes to improving global event monitoring and enhancing disaster preparedness. It provides a valuable resource for decision makers aiming to mitigate risks and ensure public safety.

[1] Kadri, U., Abdolali, A., and Filimonov, M.: GREAT v1.0: Global Real-time Early Assessment of Tsunamis, Geosci. Model Dev. Discuss. [preprint], <https://doi.org/10.5194/gmd-2024-139>, in review, 2024.

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