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## Engineering Aspects of Modifying and Enhancing NET-VISA to Incorporate Long-Term Priors

The NET-VISA software package features a physics-based probabilistic model combined with a heuristic inference algorithm to identify the most likely set of seismic events corresponding to a series of detections by a global seismic network. It has been enhanced to detect events occurring in three mediums—rock, air, and water—and supports seismic, hydro-acoustic, and infrasound sensors.

The International Data Centre (IDC) of the Comprehensive Nuclear-Test-Ban Treaty Organization is enhancing its event detection capabilities using NET-VISA. NET-VISA events are added to Standard Event Lists (SEL). We present efforts to incorporate long-term priors into the system. This approach involves generating priors from an extensive dataset spanning approximately five-ten years, capturing averaged network and station behavior across diverse environmental conditions and configurations. The extended training period could yield a comprehensive set of priors, which would then be applied to all processing over periods of a year or longer, ensuring greater consistency in event detection and analysis. We also developed a new metric to evaluate the quality of automated seismic bulletins in comparison to human-annotated ones.

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