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in Ground-Based Nuclear Explosion Monitoring Research and Development

There have been significant technological and scientific revolutions in the fields of seismology, acoustics, and radionuclide sciences with regard to the Comprehensive Nuclear Test-Ban Treaty (CTBT) which opened for signature in 1996. It is valuable to pause now and observe the arcs of progress evident in the body of research results reported in the literature related to improving monitoring capabilities. A recent document entitled "Trends in Ground-Based Nuclear Explosion Monitoring Research & Development – A Physics Perspective" reviews the accessible literature for four research areas: source physics (understanding signal generation), signal propagation (accounting for signal changes with distance), sensors (recording the signals), and signal analysis (processing the signals). The document addresses over 40 trends, such as moving from 1D to 3D earth models, from pick-based methods to full waveform methods, and from separate analysis of sensor data to integrated analysis. Highlighted in the document for each trend are the value and benefit to the monitoring mission, key papers that advanced the science, and promising research and development for the future.

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