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Upgrade of the I31KZ: Learning the Lessons of the Past and Keeping up with the State of the Art

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I31KZ, Kazakhstan, has been in operation for almost twenty (20) years. Over this period, the specific experience was gained of operating the array in hard-to-reach areas in harsh environmental conditions such as strong winds, low temperature in winter months and flooding in springtime. This experience and lessons learned allowed to minimize the risks of potential damage and loss of detectability. All critical systems, which became obsolete over the long operating period, were renovated and the most advanced available technical solutions were implemented. The station was brought to the state-of-the-art for infrasound installations. Calibration capability was added, namely site-by-site and electrical calibration of MB3a via digitizer, which became a breakthrough in station operation control. The possibility of remote array control is of prime importance for hard-to-access areas. This additional element and commonality of wind noise suppression systems improve station robustness and increases array performance, which is critical for the area with high wind noise levels. Upgrade of the power system and application of several up-to-date solutions, such as Low-noise power supplies and switch to Ethernet fiber optic from serial radios resulted in significantly higher accessibility and data quality, as evidenced by the attached statistical graphs and PSD plots.

Promotional text

A major upgrade of the I31KZ infrasound array considering the experience of array operation in a remote location and under harsh climate conditions using up-to-date equipment and techniques improved the station's ability for nuclear test monitoring and verification.

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