



Results from IMS Seismic Array in Niger

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The International Monitoring System (IMS) of the Preparatory Commission of the Comprehensive Nuclear Test-Ban Treaty Organization (CTBTO) has built a sixteen element broadband seismic array in southwestern Niger near the town of Torodi. This is the first array to be built in West Africa. The array has a diameter of 6 km (three rings with a central element), contains twelve vertical and four 3-component broadband sensors, all with identical instrument responses (Guralp CMG-3TB broadband sensors, flat to velocity from 100 seconds to 40 Hz). Many elements have seismic noise characteristics at or below Peterson's Low Noise Model at greater than 0.5 Hz. All of the sensors are emplaced in 50 m boreholes in crystalline rock.

The array is used to examine the North African Craton Structure and Seismicity. Receiver functions show that the crust is fairly simple with a Moho depth of about 38 km and Upper Mantle Discontinuities at 410 and 660 km. Because this is one of the few seismic arrays close to the Equator (array is centered at 13.2 N) and because its distance to Tonga-Fiji-New Zealand is 140-160 degrees, it could be used to look at temporal and spatial (north-south) variations in core phases. It is also used to look at Solid Earth Tides and long period diurnal signals. The array is capable of resolving and detecting events with magnitude (mb) less than 3.0 from events in Peru and Indonesia, showing that the array significantly adds to the IMS detection capabilities in the Africa region and world-wide.