

Comprehensive Nuclear-Test-Ban Treaty Instrumentation Under Extreme Tropical Conditions: Examples from Costa Rica

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The geophysical instrumentation of the CTBT worldwide is important for characterizing nuclear and chemical tests. These observatories have also strengthened the geophysical monitoring capabilities of solid-earth processes like large earthquakes and volcanic eruptions on Earth. However, assuring the correct functioning of this instrumentation is hard under extreme conditions of temperature, humidity, flora coverage and geomorphology of the tropical forest. The site Juntas de Abangares, Auxiliary Station 25 (JTS) is an example of the needs and solutions that must be carried out in these climatic conditions such as the Costa Rican jungle is. We found that developing a redundant infrastructure for both, seismic recording and telecommunications (VSAT and cellular modem) allows to transmit in real time while having a robust backup system. Under extreme conditions the use of UTP cables for data transmission can generate a long period (120 s) electronic noise that dramatically affects the quality of the data. The replacement of the UTP cables for fiberoptics reduced the effects of high temperatures and humidity of the tropical climate in the data. Furthermore, the use of external antennas helped to stabilize data transmission, since current bunker infrastructure decreased the power of cellular communication and transmission of seismological data.

Promotional text

Improvements in the transmission data in extreme tropical climate conditions.

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Oral preference format

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