



## **Development of a time synchronization methodology for a wireless seismic array**

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Seismic arrays have multiple applications. In the past, the main use was nuclear tests monitoring that began in mid-twentieth century. The major difference with a seismic network is the hypocenter location procedure. With a seismic network the hypocenter's 3D coordinates are calculated while using an array, the source direction of the seismic signal is determined. Seismic arrays are used in volcanology to obtain the source azimuth of volcanic signals related to fluids movement, magma and/or gases, that do not show a clear seismic phases' onset. A key condition in the seismic array operativity is the temporal synchronization of all the sensors, better than 1 microsecond. Because of that, usually all sensors are connected to the acquisition system by cable to ensure an identical sampling time.

In this work we present the design of a wireless low-cost and low-power consumption volcanic monitoring seismic array where all nodes (sensors) acquire data synchronously and transmit them to the center node where a coherent signal is pursued in near real time.