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Infrasound and electromagnetic sensor array in several configurations for monitoring active volcanoes in Ecuador

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The scope of the prototype presented in this work was to create a compact and flexible sensor array, reliable enough to be used in volcanic monitoring. In order to achieve this objective, we used an Spartan-6 L X 45 FPGA as the base of the embedded system, getting the capability of continuous acquisition at a configurable velocity up to 50 kbps. In addition, the equipment has some features as 12 24-bit ADC channels available and expandable to 24 channels, USB and SD-card data storage, Ethernet communication port, LCD display for basic information and time synchronizing via external GPS. As a direct application of this prototype, a mathematical model based on the solution of Maxwell's equations was implemented to obtain a comparison pattern that was verified with the results obtained by field tests in the Chiles and Cerro Negro volcanoes and the processing of signals by software specialized in arrays.

Promotional text

It is a new technique that is being applied in volcanic monitoring, in Latin America it has not been applied yet and Ecuador is a pioneer in applying it and compared to other techniques, good results are being obtained.

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