Volcanoes may reveal secrets through 'song'

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Kurt Kleiner

Active volcanoes are being made to "sing" by researchers who convert seismic data into frequencies audible to human ears. Although the volcanoes are unlikely to sell many records, the technique could make it easier to detect patterns that warn of an eruption.

High-powered computers are being used to convert seismic readings from Mount Etna in Sicily and Tungurahua in Ecuador into audible rumbles, roars, beeps, and even piano music.

The technique, known as "sonification", is used to help people detect patterns in complex data. Research has shown that people find it easier to detect patterns audibly rather than visually. While the eye can quickly become confused by visual representations of very complex data, the ear is very good at sorting patterns from random noise.

"The human ear is a logorithmic device. It's much more sensitive than the human eye," says Roberto Barbera, a physicist at the University of Catania in Italy. "We can figure things out that we couldn't otherwise." Barbera and colleagues at the University of Salerno, Italy, have been working at sonifying the data from Mount Etna, one of the most active volcanoes in the world. Recently they added information from the Ecuadorian volcano.

Avant-garde piano

Sonification is very computer intensive, so the researchers used the European GEANT2 and Latin American ALICE-RedCLARA research computer networks to process the information.

The researchers have made the volcanoes sound like heavy wind outside the window in one case, like a powerful engine idling in another. They also mapped the sounds onto MIDI piano, resulting in some avant-garde-sounding pieces. Listen to the piano versions of Mount Etna and Tungurahua in action.

Bruce Walker, a psychologist at the Georgia Institute of Technology, US, says that a number of researchers are experimenting with sonification to help them analyse complex information. "The auditory system is the best pattern recognition device we have. If you're trying to find patterns in complex, time-varying data, then listening to it is much more effective than looking at it," he says.

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