



Diatomites sound like a B13 chord

Antonio Menghini (1), Stefano Pontani (2), Tiziana Lanza (3), and Vincenzo Sapia (3)

(1) Aarhus Geofisica, Pisa, Italy (antonio.menghini@aarhusgeo.com), (2) Freelance musician, Rome, Italy (stefanopontani@hotmail.it), (3) INGV, Rome, Italy (tiziana.lanza@ingv.it)

EMusic (ElectroMagnetic Music) is a scientific-musical project born in Italy from the idea that it is possible to transform voltage responses collected by Transient ElectroMagnetic Method (TEM - a well-known geophysical tool for exploring the subsurface), into musical pitches (Menghini and Pontani, 2016; Menghini, 2016). This approach allows to extract musical pieces, derived from and in harmony with the existing geological setting. Then, it is possible to claim that any site has its own “soundscape” (the audio component of a landscape).

In this occasion, we will show the didactic potential of the project. How it facilitates the explanation of complicated Earth Physical Sciences like EM, in a funny way and to a wide audience. We will also show its capability to enhance the awareness and interest for geological and natural heritage. It is not a case that we have started a collaboration with some Italian schools. EMusic is the device to introduce young scholars to local Geology, Paleogeography, Geophysics, Natural risks, Earthquakes, Landslides, Music, Improvisation, Musical composition. We will propose an excerpt of an EM concert performed in the Ancient Roman Theater of Ferento, Central Italy, last summer. We will show the active role of the geoscientist, the one introducing any track and preparing the audience about what they are going to listen. The audience experience a journey into the Earth by riding the eddy currents produced by the EM field. It is not only a travel in space, but also in time, since we explore through music, always older geological formations. The first composition allows us to explain how the TEM method works, going into technical details about the instrumentation. We explain how geophysicists can model the subsurface, by comparing the decay rate of the transient with the interval among pitches (tight interval for conductive layers and wide one for the resistive units).

During the second composition the musicians begin to interplay with the pitches provided by the Earth: we reverse the first track, so that people can listen to the return, from the maximum exploration depth (in this case about 100 m) to the surface. The saxophonist and the guitarist are able to improvise over the EMusic base, by using the same pitches, in a sort of natural jam session, where the Earth is the band leader.

Then, we analyze each geological formation, by showing the musical mood provided by the relative pitches.

References:

Menghini A. and Pontani S. (2016) – What is the sound of the Earth ? First steps into EMusic. *First Break*, vol. 34, 41-46.

Menghini A. (2016) – Canto Flegreo: Sounds from an active volcanic crater. *FastTimes*, vol. 21, no. 2, 39-42.