

Seminar

TERAHERTZ: EXPERIMENTAL APPLICATIONS IN GEOPHYSICS

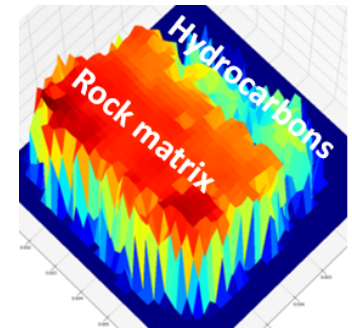
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March 3rd, 11:00 hs



**THz refractive index image
of an oil shale**

Abstract: The seminar will address my last two years research results obtained over Terahertz (THz) applications in the geophysical domain. First, I'll give a brief description about THz technology (sources and detectors) and next talk about THz experimental implementations I carried on to characterise THz dielectric permittivity fabric of oils shales from 'Vaca Muerta'. This means the characterization of the spatial and geometric configuration of the rock links to the polarisation response of bounded charges when applying an electric field. This approach done for the first time shows that within current applied methods, THz-Time domain spectroscopy allows for more accurate fabric characterization and more sensitivity to discriminate the degree of shale anisotropy. Also, I will present THz images of oil shales, which could be used to obtain information about their organic matter and maturation.

Another application I will present is about the detection of fractures and lithological changes in rocks using a frequency modulated continuous wave radar working at 300 GHz. The results obtained for the first time show that the radar could quantify millimetre fractures after 1 cm rock penetration depth with a sensitivity of 500 μm .

Finally, beyond the THz applications in geophysics I will present a new electronic model of the geophysical phenomenon known as 'seismoelectric effect'.