Imaging a Late-Variscan gneissic dome with passive seismic methods: the GOLDFINGER Project.

Imma Palomeras*[1], Juan Gomez Barreiro[1], Puy Ayarza*[1], Sara Rodriguez[2], José Ramón Martínez Catalán[1], David Marti[3], Mario Ruiz[3], Santos Barrios Sánchez[1], Kelvin Dos Santos[1], Yolanda Sanchez Sanchez[1], Javier Elez[1], Mariano Yenes[1], Irene Defelipe[1], and Irene Pérez-Cáceres[1]

[1]Departamento de Geología [Salamanca] – Espagne
[2]Departamento de Geología [Salamanca] – Espagne
[3]Geosciencies Barcelona – Espagne

Résumé

During the late stages of the Variscan orogeny, generalized gravitational collapse with coeval magmatism took place in the Central Iberian Zone, in Iberia. This event is getting the attention of the community due to its role in the generation of strategic mineral resources. In this regard, in order to study how the Variscan orogenic architecture controls the generation of mineral deposits (i.e. Sn, W, Nb, Ta, Sc, Au, Sb) the GOLDFINGER project was born. With this goal, a 3D model of a gneissic dome with several mineral deposits will be constructed based on high-resolution geophysics (Seismic/Gravity/Magnetism), and regional geology. The study area encompasses the Martinamor gneiss dome, representing a Late-Variscan syn-collisional extensional system with a well-preserved architecture. This gneiss dome presents low topography, and contrasting lithotypes, which could provide a conspicuous response regarding seismic, gravity, and magnetic experiment. As part of the project, in spring 2022 the area was covered by a regular grid featuring low-period seismic recorders with 2Hz sensors which were continuously recording in the field for up to 40 days. The final 35x40 km grid consisted of 60 nodes, separated by approximately 4.5 km. We are using a state-of-the-art technique to retrieve high-resolution seismic images of the Martinamor gneiss dome using seismic interferometry applied to seismic background noise (SBN). The preliminary results show that SBN interferometry allows us to detect and track discontinuities that can be related to the structures that control the ore deposits. In this contribution, we present the GOLDFINGER geophysical experiment and the preliminary results. Funding: grant PID2020-117332GB-C21 funded by MCIN/ AEI /10.13039/501100011033; EIT-Raw Materials project 17024 (SIT4ME: Seismic Imaging Techniques for Mineral Exploration); SA085P20 from the JCYL government, and TED2021-130440B-I00 by MCIN. IP is funded by MCIU and USal (BEAGAL18/00090).

Mots-Clés: Late, Variscan gneissic dome, Passive Seismology, Ore deposits

*Intervenant