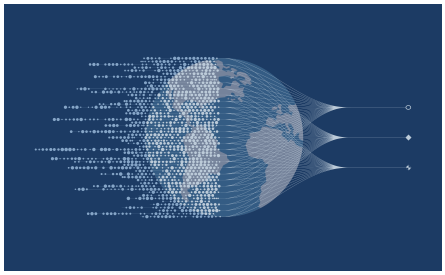

ID: **P2.2-337** Type: **E-poster**

and seismic source characterisation of an unknown sonic boom in the Tyrrhenian Sea

On 20 June 2024, a powerful sonic boom shook the inhabitants of Elba Island (Tuscany, Italy) and was heard in a huge area on the Tuscan coast. The unknown phenomenon generated infrasonic and seismic signals which were recorded by three infrasonic arrays deployed in Elba Island (ELB), on Mount Amiata (AMT, southern Tuscany) and in Aosta Valley, and by 20 seismic stations located throughout Tuscany.
Array processing of infrasound data recorded at ELB and AMT arrays allowed us to locate the source in the Tyrrhenian Sea, ~50 km south of Montecristo Island. With infrasound ray-tracing we reconstructed a source altitude around 70 km in the atmosphere, consistently with signal arrival times at the two arrays.
The obtained localization is in perfect agreement with the source location (~50 km south of Montecristo Island and ~75 km altitude) computed analysing the arrival times at the 20 seismic stations and assuming a constant wave propagation velocity.
An estimation of the source yield ~1 kt is also given based on recorded infrasound.
The recorded waveforms, the estimated energy, as well as the reconstructed high source altitude are consistent with an unreported fireball event crossing the Tyrrhenian Sea and exploding in the high atmosphere.

E-mail

g.belli@unifi.it

In-person or online preference

Primary authors: Dr FIASCHI, Andrea; Dr GHERI, Duccio (Istituto Nazionale di Geofisica e Vulcanologia (INGV)); Prof. MARCHETTI, Emanuele (Università di Firenze); Dr BELLI, Giacomo (Università di Firenze); Mr GALFO, NIccolò

Presenter: Dr BELLI, Giacomo (Università di Firenze)

Session Classification: P2.2 Seismoacoustic Sources in Theory and Practice

Track Classification: Theme 2. Monitoring events and Nuclear Test Sites: T2.2 Seismoacoustic Sources in Theory and Practice