

of a signal detected at a Hungarian infrasound array on 12 December 2017

On 12 December 2017 a heavy detonation occurred near Baumgarten about 30 km east of Vienna, Austria, around 9 am local time. Seismo-acoustic signals were detected at AlpArray seismic stations up to 150 km distance (Schneider et al., 2018) providing evidence from 3D raytracing for both tropospheric and stratospheric arrivals and inferring an origin time of 7:44:16 UTC. The infrasound array PSZI deployed in May 2017 by the Hungarian NDC consists of 4 elements within 400 m, located at the Piszkes Observatory (48.32 N, 16.87 E) at a range of ~230 km east-southeast from Baumgarten. From PMCC processing and F-K analysis an acoustic signal at 7:57:55 UTC is found with backazimuth of 296-300 degrees and slowness of 273 s/degree, respectively, resulting in extraordinarily high trace-velocity (>400 m/s) and azimuth residual. With 3D raytracing through the ECMWF model for the particular date we are able to explain a trace-velocity in excess of 400 m/s from stratospheric winds exceeding 100 m/s along the travel path. The azimuth residual is in part explained by these winds, but also results from array element altitude differences. Thus, the case is made that the PSZI signal is indeed associated with the Baumgarten explosion.

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Track Classification: Analysis of Sources and Scientific Applications