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of the 2022 South Atlantic fireball using IMS infrasound recordings

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On 7 February 2022, a large meteoroid entered the Earth's atmosphere around 500km off the coast of Namibia and South Africa. NASA's Center for Near Earth Object Studies (CNEOS) lists the event as a fireball with an impact energy of 7kt TNT equivalent. This energy estimate is about 60 times lower than for the 2013 Chelyabinsk fireball (440kt, CNEOS). For Chelyabinsk, IMS infrasound data analysis revealed that it was the strongest event ever recorded by the IMS infrasound network at that time, when 20 out of 42 existing stations detected it. The second-strongest event of this type in the IMS era was the Bering Sea bolide in December 2018 (49kt, CNEOS), with a comparable portion of infrasound stations detecting it (25 out of 51).

For the 2022 South Atlantic fireball, we identify signatures at 25 IMS infrasound stations (out of 53). We further characterize the event using the observations and propagation models, and assess the detection capability to explain the large number of detecting stations. We also use the IMS data for estimating an energy release, and revisit previous strong events such as Chelyabinsk using state-of-the-art array processing methods and enhanced configurations. These comprise, for instance, the Multi-Channel Maximum-Likelihood (MCML).

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