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On the use of complex rays to analyse the sonic boom of the Carancas meteorite at I08BO station located into shadow zone

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The International Monitoring System (IMS) network of the Comprehensive nuclear-Test-Ban Treaty (CTBT) detects powerful natural and artificial infrasonic sources. One of these sources are meteorites which produce multi-arrival pressure signatures similar to explosion ones. Long range sonic boom modeling allows to distinguish these sources from one another. Our documented case is the Carancas meteorite that impacted the ground in Peru on September 15th, 2007, near the IMS infrasound station I08BO. Since this station is located within the shadow zone, classical ray tracing cannot be used to capture the characteristics of the recorded arrivals. Analytic continuation into complex plane of emission parameters of the ray tracing method allows to analyse the propagation in shadow zone for fully three dimensional problems. Contribution of complex ray ordinary differential equations integration and optimisation algorithm allows to compute complex eigenrays. Simulated infrasound wave arrival times, azimuths and apparent velocities at the station are compared with Carancas records.