EGU22-12472
https://doi.org/10.5194/egusphere-egu22-12472
EGU General Assembly 2022

Search for the parent body of the recently fallen iron meteorite

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On November 7, 2020, a bright fireball was observed over Sweden, and 13.8 kg iron meteorite was later recovered. Multiple observations of the fireball were conducted from Denmark, Finland, and Norway, making it the first instrumentally documented fall of an iron meteorite.

We used the instrumental recordings of the bolide to reconstruct its preatmospheric orbit, and studied the past orbital evolution of the meteoroid. We found no close affinity of the orbit of the meteoroid with any near-Earth asteroid. The long YORP timescale suggests that the meteoroid could have arrived intact from the main asteroid belt. Our analysis of the orbit shows that the meteoroid probably entered its near-Earth orbit via either the □□6 secular resonance with Saturn or the 3:1 mean motion resonance with Jupiter.

The work was partially funded by the National Research Foundation of Ukraine (project N2020.02/0371).