

Tunguska explosion and the Earth's magnetic field

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For at least a century, the geophysicists have been wondering about the future of the Earth's magnetic field and whether it is going to flip, while the astrophysicists have been wondering what kind of celestial body exploded on June 30, 1908 by the river of Podkamennaya Tunguska. Using the data recently made available by NOAA, we demonstrate an intimate relationship between the two, previously thought completely unrelated, phenomena.

Fig. 1 shows the Earth's magnetic field in 2015, it had three maxima: 1) North-Eas-

tern at 61.6° N, 103.2° E, value 61 656.2 nT; 2) North-Western at 62° N, 100.8° W, value 5 9017.1 nT; 3) southern at 60.3° S, 136.4° E, value 67 001.9 nT.

NOAA's model of the Earth's magnetic field <https://www.ngdc.noaa.gov/geomag/calculator/s/magcalc.shtml#igrfgrid> reveals that the North-Eastern maximum did not exist until about 1765; once it appeared, it has been moving towards the epicenter of the Tunguska explosion (ETE) at 60.917°N, 101.95°E. The positions of the North-Eastern maximum on 1765/1/1, 1780/1/1, 1908/6/30, 2019/2/10 are

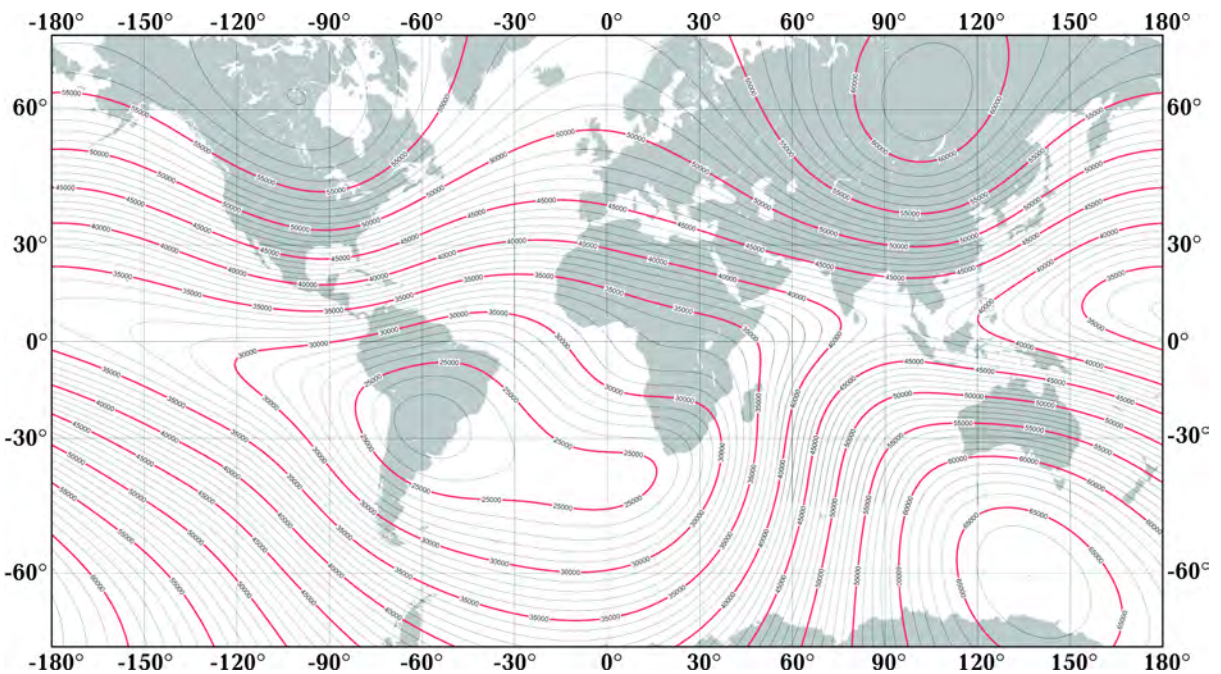


Fig. 1. Map from <https://www.ngdc.noaa.gov/geomag/magfield-wist/>.

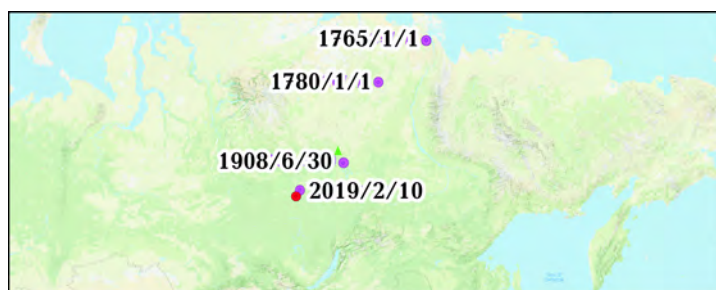


Fig. 2. Data from <https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#igrfgrid>, plotter <https://www.darrinward.com/lat-long/?id=5a292ecf87f4b5.09773456>. Magenta circles indicate the location of the North-Eastern maximum on the dates shown, according to IGRF prior to 2018 and according to WMM after 2018. ETE is shown by the red circle. The green triangle shows the Siberian Death Valley at $63:8^{\circ}$ N; $110:65^{\circ}$ E; at the time of the Tunguska explosion the North-Eastern maximum was 120 km from the center of the Death Valley.

shown in Fig. 2; their coordinates, distance from ETE and total intensity were:

1765/1/1 at 72.1° N, 125.9° E,
 ≈ 1610 km from ETE, value 61547.5;

1780/1/1 at 69.6° N, 117.1° E,
 ≈ 1190 km from ETE, value 61161.3;

1908/6/30 at 63.8° N, 110.65° E,
 ≈ 550 km from ETE, value 61472.8;

2019/2/10 at 61.5° N, 102.7° E,
 ≈ 76 km from ETE, value 61713.3.

The North-Eastern maximum is currently only 76 km away from ETE. Such steady march of the North-Eastern maximum towards ETE cannot be coincidental.

As shown in Fig. 3, since 1900 and up to 2019 the magnetic North Pole has also been moving towards ETE along a path that looks almost like straight line in the coordinates

of Fig. 3. It looks like in 1900—2010 the magnetic North Pole has been but a “weighted average” of the North-Eastern and North-Western maxima; as the relative contribution of the North-Western maximum to the Earth’s magnetic field declines and the relative contribution of the North-Eastern maximum to the Earth’s magnetic field increases, the magnetic North Pole shifts from the North-Western maximum to the North-Eastern maximum.

Can all of these be merely coincidental? It is very unlikely. Since the motion of the North-Eastern maximum towards the location of ETE started in 1765, or 143 years before the Tunguska explosion, we must rule out that the somewhere-hidden remnants of the Tunguska “meteorite” are somehow attracting the North-Eastern maximum. The only reasonable explanation is that the 1908/

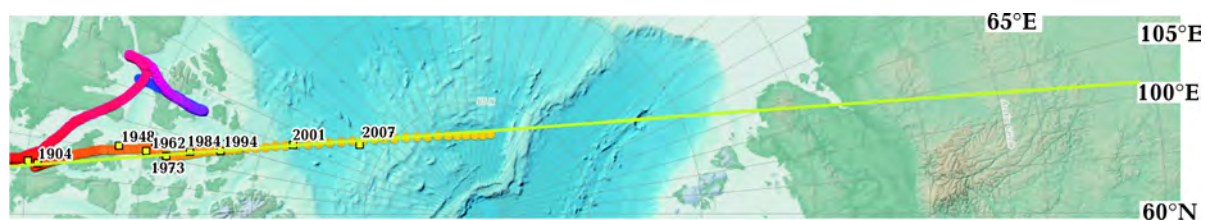


Fig. 3. Modelled path of the magnetic North Pole, https://maps.ngdc.noaa.gov/viewers/historical_declination/. Little squares show measured locations. The straight line is drawn to more-or-less fit the actually measured locations in 1973, 1984, 1994, 2001, and 2007; its right-most point is within kilometers of the ETE. On the globe the straight line is neither straight nor a great circle.

6/30 explosion near the river of Podkamenaya Tunguska was not that result of a celestial body but the one of terrestrial origin related to the Earth's magnetic field.

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