# ESA launches Swarm research satellites in Russia (Update)

22 November 2013

The European Space Agency (ESA) on Friday launched a trio of hi-tech satellites on an unprecedented mission to map anomalies in Earth's magnetic field.

The 230-million-euro ($276-million) Swarm mission blasted off in fog aboard a Rokot launcher from Plesetsk in northwestern Russia at 1602 GMT, ESA showed in a live feed.

The launch, postponed from November 14, was the third by the Russian-made Rokot from Plesetsk this year, the Russian defence ministry said.

ESA said the satellites reached a near-polar orbit 91 minutes after launch and all sent signals back home.

The sophisticated monitors are identical, each weighing 470 kilod (1,034 pounds) and carrying instruments on an extendable boom.

They are due to operate at extremely low altitudes close to the edge of the atmosphere to measure the strength, orientation and fluctuations of the Earth's geomagnetic field.

Two will fly initially at 460 kilometres (287 miles), reduced after four years to just 300 kilometres (180 miles).

The third will start at 530 kilometres (331 miles), to offer a different angle of view.

The project aims at providing the most accurate measurements ever of Earth's magnetic field, in a mission designed to last at least five years.

The magnetism derives mainly from superheated liquid iron and nickel, which swirl in the outer core about 3,000 kilometres (1,800 miles) beneath the planet's surface.

Like a spinning dynamo, this subterranean metal ocean generates electrical currents and thus a magnetic field.

But the field is not constant.

The gap between the magnetic north pole and the geographical north pole has been widening since 2001 at the rate of 65 kilometres (40.6 miles) per year, compared with just 10 kilometres (six miles) per year in estimates in the early 1990s.

In addition, the magnetic field has been weakening. Since the mid-19th century it has lost around 15 percent of its strength.

Some experts wonder if this is a prelude to a reversal of magnetic polarity, something which usually occurs around every 200,000 to 300,000 years but is now considered long overdue.