

Evidence found of regional magnetic field anomaly in Southeast Asia 800 years ago

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An international team of researchers has found evidence of a regional magnetic field anomaly in Southeast Asia, approximately 800 years ago. In their paper published in *Proceedings of the National Academy of*

Sciences, the group describes their study of slag and other remnants left over from iron smelters who once worked in a part of Cambodia formerly known as Tonle Bak and what they found.

From approximately the 11th century through the 14th century, smelters were creating iron objects at Tonle Bak—a time when the area was part of the Khmer Empire. As part of their process, the workers would periodically dump residue from their smelting operations onto a nearby site. Over time, 50 hills of the material built up. Because so much of the material contained metal, the hills served as a record of the [magnetic field](#) in the area for the years it was dumped there. In this new effort, the researchers extracted material from several of the hills and then studied them to learn more about the magnetic field in that part of the world during the years 1034 to 1391.

In looking at their data, the researchers found that over a century—between 1200 and 1300—the magnetic field in Southeast Asia changed direction by almost .05 degrees each year. The inclination dropped from approximately 30 degrees to just five degrees. The researchers also found a change in intensity during the same [time period](#)—it decreased from 44 microteslas to just 27.

The findings by the researchers show that approximately 800 years ago there was a regional magnetic [anomaly](#) in Southeast Asia. They suggest the weakening they observed was likely part of a wider anomaly that stretched all the way to the equator—a phenomenon that has been described as the 'flux expulsion' at low latitudes. They acknowledge that they were unable to find any explanation for the anomaly but suggest it could have been due to interference resulting from turbulence occurring at the Earth's core/mantle boundary. They also note that many such anomalies have been found and studied—one of them is occurring today below southern parts of the Atlantic Ocean.

More information: Shuhui Cai et al. Archaeomagnetic results from Cambodia in Southeast Asia: Evidence for possible low-latitude flux expulsion, *Proceedings of the National Academy of Sciences* (2021). [DOI: 10.1073/pnas.2022490118](https://doi.org/10.1073/pnas.2022490118)

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