GRAVITATIONAL WAVES EXPLAIN PLANETARY MAGNETIC FIELDS

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Abstract -

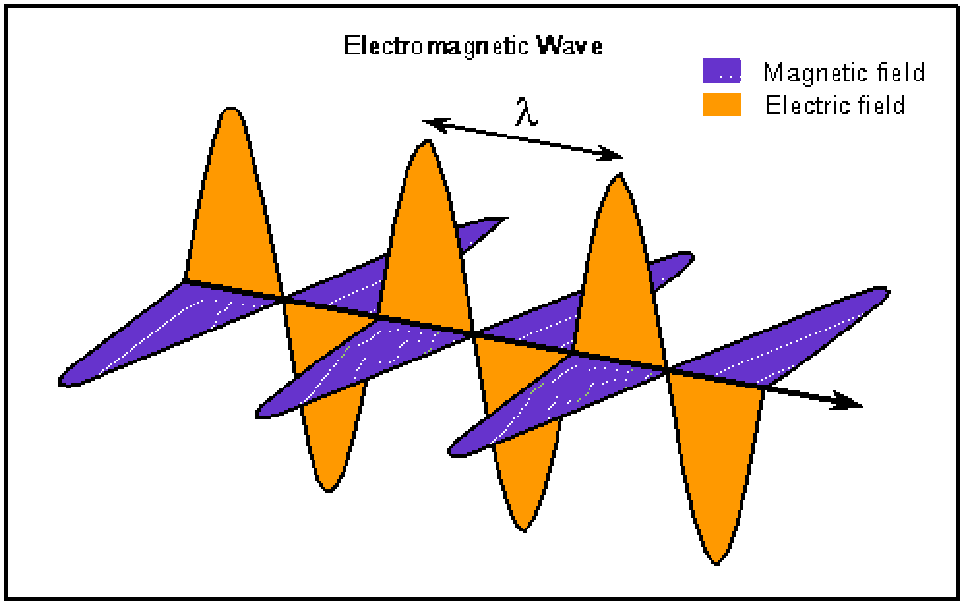
The cause of Earth's magnetic field is said to be the geodynamo, also called the magnetic dynamo theory. The heat from the solid inner core puts the liquid outer core in motion, and the movements of the outer core's electrically conducting fluids (such as molten iron) generate the planet's magnetic field. Electrically conducting fluids occur in the Sun, other stars and most planets – and are the scientifically accepted mechanism for magnetic fields. However, the planets Mercury and Venus suggest this process is only partly correct.

Article -

The Meissner effect (or Meissner–Ochsenfeld effect) is the expulsion of a magnetic field from a superconductor* during its transition to the superconducting state. The German physicists Walther Meissner and Robert Ochsenfeld discovered this phenomenon in 1933. Regarding the Meissner effect: Think of the electromagnetic wave relativistically. In General Relativity, the simple analogy of space-time being regarded as a rubber sheet is commonly used. Instead of resorting to complex and lengthy relativistic mathematics, we can simply picture an electromagnetic wave as a cylinder made of rubber. If 2 sides of the cylinder are pushed in with your fingers (say, the ones representing the electric component), the sides in the perpendicular direction (representing the magnetic component) will bulge outwards - this can be verified by placing a ruler behind the cylinder. Compressing the electric component will force the magnetic component to bulge outwards ie there will be little or no magnetic field within the superconductor, only an external magnetic field. An externally-applied magnetic field also conforms to the bulging outwards and is expelled from within the superconductor.

* High temperature superconductors are known for not displaying the Meissner effect. The explanation below of planetary magnetic fields means, though the fields

cannot be a product of the condensed-matter physics known as superconductivity, they might be considered a previously unrecognized variation of superconductivity, which is zero (electrical) resistance.



An electromagnetic wave showing electric and magnetic fields, and the wavelength (λ) which is the distance between crests of a wave.

Courtesy of nrao.edu

An electromagnetic wave can have its electrical part compressed through eg introduction of copper-and-oxygen compounds called cuprates or use of hydrogen sulfide (speaking of molecules as well as waves refers to quantum mechanics' wave-particle duality). If compression is sufficient; the electric component no longer follows a long, curved path but its path is now linear and follows the shortest distance between two points. In other words, a superconductor that operates at room temperature and normal atmospheric pressure has been manufactured. Any resistance would, like a rock in a stream causing water to flow around it, lengthen the distance and mean the compound is not a perfect superconductor.

"Magnetic Fields" (http://www.astronomynotes.com/solarsys/s7.htm) says, "Mercury's situation was a major challenge to the magnetic dynamo theory. In true scientific fashion, the theory made a testable prediction: Mercury should have no magnetic field or one even less than Mars' one because its core should be solid. Observation, the final judge of scientific truth, contradicted the prediction. Should we have thrown out the magnetic dynamo theory then? Astronomers were reluctant to totally disregard the theory because of its success in explaining the situation on the other planets and the lack of any other plausible theory. Is their reluctance a violation of the objectivity required in science? Perhaps, but past experience has taught that when confronted with such a contradiction, nature is telling you that you forgot to take something into account or you overlooked a crucial process."

The idea of compressed electric fields (they could be compressed by gravitational, or gravitational-electromagnetic, waves) and bulging, expelled magnetic fields is a very plausible alternative to Earth's geodynamo. It gains additional support by explaining why the planet Mercury has a significantly strong, apparently global, magnetic field (approx. 1.1% of Earth's).(7,8,9) Venus' core is thought to be electrically conductive and, although its rotation is often thought to be too slow, simulations show it is adequate to produce a dynamo. Simple reversal – compression of electromagnetism's magnetic component with expulsion of the electric component - means certain astronomical bodies, such as the planet Venus, could have no intrinsic magnetic field as a result. (It does have a much weaker one than Earth, induced by an interaction between the ionosphere and the solar wind).(10,11,12) But it would have a strong electric field – and the European Space Agency's Venus Express spacecraft did detect one.(13)

How does this alternative account for magnetic-field reversals? The incoming gravitational waves can compress electric fields, resulting in a strong magnetic field. As motions in planetary cores occur, relocated electric waves can be compressed less, causing reduced expelling of the magnetic waves and weakening of Earth's field. Electromagnetic waves can change orientation by 180 degrees, causing the expelled magnetism's polarity to reverse.

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