The Hunt for Magnetic Monopoles in the Milky Way Galaxy

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Experts in particle theory tend to believe in the existence of a particle which acts like a magnet with just one pole, called the "magnetic monopole"—yet no magnetic monopole has ever been found. Monopoles likely take too much energy to create in a lab, which limits us to search for monopoles which already exist somewhere in our Milky Way Galaxy. This research project examines the behavior of magnetic monopoles traversing through the galaxy. Would the monopoles be quickly forced out of the galaxy by the omnipresent magnetic field? Is there an opportunity for them to form stable orbits? How likely is it for a monopole to hit the earth, if it came from a random direction? These questions are addressed through computer simulations of monopole trajectories using a model of the magnetic field Jansson and Farrar (2012).

Reference List:

Jansson, Ronnie and Farrar, Glennys 2012. A New Model of the Galactic Magnetic Field. The Astrophysical Journal, 757:14