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*Fermi acceleration*

Fermi acceleration is a mechanism, first suggested by Enrico Fermi in 1949, to explain heating of particles in cosmic rays. Fermi studied charged particles being reflected by the moving interstellar magnetic field and either gaining or losing energy, depending on whether the “magnetic mirror” is approaching or receding. In a typical environment, Fermi argued, the probability of a head-on collision is greater than a head-tail collision, so particles would, on average, be accelerated. Since then Fermi acceleration has been used to explain a number of natural phenomena and several simple mathematical models demonstrating Fermi acceleration have been proposed. We describe these models and explain why they do or do not exhibit Fermi acceleration. We also mention some models where the answer is not known.