

Generation of strong magnetic fields in quark stars driven by the electroweak interaction of quarks

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We study the generation of strong large scale magnetic fields in dense quark matter. The magnetic field growth is owing to the magnetic field instability driven by the electroweak interaction of quarks. We discuss the situation when the chiral symmetry is unbroken in the degenerate quark matter. In this case we predict the amplification of the seed magnetic field 10^{12} G to the strengths $(10^{14} - 10^{15})$ G. In our analysis we use the typical parameters of the quark matter in the core of a hybrid star or in a quark star. We also discuss the application of the obtained results to describe the magnetic fields generation in magnetars.

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