

## Equation of state of strange quark matter in a nonuniform magnetic field

*Friday, 14 October 2016 13:15 (20)*

Thermodynamic properties of strange quark matter (SQM) in a nonuniform magnetic field are studied within the phenomenological MIT bag model under the charge neutrality and beta equilibrium conditions, relevant to the interior of strange quark stars. The spatial dependence of the magnetic field strength is modeled by the dependence on the baryon chemical potential. The total energy density, longitudinal and transverse pressures in magnetized SQM are found as functions of the baryon chemical potential. It is clarified that the central magnetic field strength in a strange quark star is bound from above by the value at which the derivative of the longitudinal pressure with respect to the baryon chemical potential vanishes first somewhere in the interior of a star under varying the central field. Above this upper bound, the instability along the magnetic field is developed in magnetized SQM.

**Primary author(s)** : ISAYEV, Alexander (Kharkov Institute of Physics and Technology)

**Presenter(s)** : ISAYEV, Alexander (Kharkov Institute of Physics and Technology)

**Session Classification** : Nuclear physics and particle physics - parallel VIII

**Track Classification** : Nuclear physics and particle physics