11. Česko-Slovenská studentská vědecká konference ve fyzice (ČSSVK2020)

 Contribution ID: 7

 Type: not specified

Vortex solutions of Liouville equation and quasi spherical surfaces

Friday, 18 September 2020 10:15 (15 minutes)

We identify the two-dimensional surfaces corresponding to certain solutions of the Liouville equation of importance for mathematical physics, the non-topological Chern-Simons (or Jackiw-Pi) vortex solutions, characterized by an integer $N \ge 1$. Such surfaces, that we call $S^2(N)$, have positive constant Gaussian curvature, K, but are spheres only when N = 1. They have edges, and, for any fixed K, have maximal radius c that we find here to be $c = N/\sqrt{K}$. If such surfaces are constructed in a laboratory by using graphene (or any other Dirac material), our findings could be of interest to realize table-top Dirac massless excitations on non-trivial backgrounds. We also briefly discuss the type of three-dimensional spacetimes obtained as the product $S^2(N) \times \mathbb{R}$.

Primary author: Mr KŮS, Pavel (MFF UK)
Co-author: Prof. IORIO, Alfredo (MFF UK, assoc. prof. (docent), ÚJČF)
Presenter: Mr KŮS, Pavel (MFF UK)
Session Classification: Teoretická fyzika

Track Classification: Teoretická fyzika