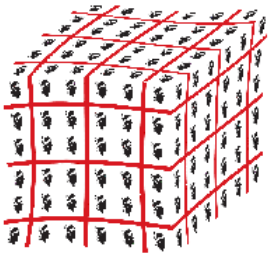

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Lattice Index Theorem and Fractional Topological Charge

Tuesday, 15 June 2010 14:30 (20 minutes)

We study topological properties of classical spherical center vortices from the low-lying eigenmodes of the Dirac operator, in both the overlap and asqtad formulations, fundamental and adjoint representation. In particular we address the puzzle raised in a previous work of our work group\ [Phys. Rev. D 77, 14515 (2008)], where we found a violation of the lattice index theorem with the overlap Dirac operator even for "admissible" gauge fields. We confirm the discrepancy between the topological charge and the index of the Dirac operator also for the other, above mentioned representations. Furthermore we find some evidence for fractional topological charge during cooling the spherical center vortex on a $40^3 \times 2$-lattice. The object with topological charge $Q = 1/2$ we identify as a Dirac monopole with a gauge field fading away at large distances. Therefore even for periodic boundary conditions it does not need an antimonopole.

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talk

Primary author: HÖLLWIESER, Roman (VUT)

Co-authors: FABER, Manfried (VUT); HELLER, Urs M. (APS)

Presenter: HÖLLWIESER, Roman (VUT)

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