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A uniqueness property for selfdual Cern–Simons vortices of topological type

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Abstract

We consider a model proposed by Jackiw–Weinberg and Hong–Kim–Pac in the context of Chern Simons theory as an alternative to the more conventional Maxwell–Higgs theory. Both theories admit a selfdual structure, and it is known that the selfdual Chern–Simons vortex theory is richer in comparison with the selfdual Maxwell–Higgs vortex theory. Indeed each vortex in the latter theory is uniquely determined by the position of its vortex points, while those parameters no longer suffice to identify Chern-Simons vortices. Actually, one finds two main classes of selfdual C.S. vortices: those of topological type (classified according to the homotopy classes of the gauge group) and those of non-topological type. Reasonably, one believes that only the topological vortices should be considered as the equivalent of the M.H.-vortices and thus share their properties. In this talk we support this fact by showing that in analogy to selfdual M.H.-vortices, also the C.S.-vortices are uniquely identified by their vortex-point's configuration, where the electric and magnetic flux strongly localize.