

Some Analytical Properties Related to a Witten-Type Functional

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Abstract - The aim of this article is to give some properties of a Witten-type functional and of its Euler-Lagrange associated equations in the abelian case (S^1) for $\dim(X) = 3$. Very important are the analytical properties: coercivity of the functional, an upper bound for its weak critical points and the regularity of the weak critical points. We consider Sobolev completions of the configuration space extending the functional to such spaces. This paper is inspired by [8], article related to the $\dim(X) = 4$ -case. In order to give more complete proofs (which can be adapted to dimension 4 as well) we have used a generalized version of the Bianchi identity that we gave in [29].

Key words and phrases : spinor, connection, curvature, Sobolev completion, Euler-Lagrange equations.

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