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Leiden
The Netherlands

Multi-calorons and their moduli

Nogradi, D.

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Stellingen

belonging to the thesis
Multi-calorons and their moduli

1. Finite temperature $SU(n)$ instantons of topological charge k with non-trivial holonomy and zero over-all magnetic charge are built up from nk massive constituent monopoles.

Chapters 3-4-5

2. The most general $SU(2)$ caloron of charge 2 is given in terms of elliptic integrals and solutions of polynomial equations.

Section 3.5

3. In the abelian limit, the conserved quantities of the Nahm equation are the multipole moments of the chiral Dirac zero-mode densities in the caloron background.

Section 4.1.1

4. There is a one-to-one correspondence between the moduli space of calorons with non-trivial holonomy and vanishing over-all magnetic charge and the moduli space of stable holomorphic bundles on the projective plane that are trivial on two lines.

Section 5.3.1

5. The relevance of measuring instanton size distributions on the lattice using cooling in the confined phase is in doubt as the lumps are constituent monopoles and not instantons.

6. It may turn out ultimately that there is no beautiful conceptual answer to the question of confinement, rather it *just happens to be the case* that quarks confine. However, this is no reason to panic.

7. The statement «instantons do not play a role for large n » was believed for a long time to be true, however, it is wrong. Handwaving arguments are always suspicious.

8. String theory penetrates every possible field of high energy physics, a fact which may be loved or hated, but definitely may not be ignored.

9. If we use the word «explanation» to mean something absolute, then religion aims at *explaining* – and not describing – the world, whereas science is about *describing* – and not explaining – it. Thus, there can not possibly be any contradiction between the two.

Dániel Nógrádi
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