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High Energy Physics - Theory

Graded Hopf Maps and Fuzzy Superspheres

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(Submitted on 24 Jun 2011 (v1), last revised 26 Aug 2011 (this version, v2))

We argue supersymmetric generalizations of fuzzy two- and four-spheres based on the unitary-orthosymplectic algebras, suosp(N|2) and suosp(N|4), respectively. Supersymmetric version of Schwinger construction is applied to derive graded fully symmetric representation for fuzzy superspheres. As a classical counterpart of fuzzy superspheres, graded versions of 1st and 2nd Hopf maps are introduced, and their basic geometrical structures are studied. It is shown that fuzzy superspheres are represented as a "superposition" of fuzzy superspheres with lower supersymmetries. We also investigate algebraic structures of fuzzy two- and four-superspheres to identify su(2|N) and su(4|N) as their enhanced algebraic structures, respectively. Evaluation of correlation functions manifests such enhanced structure as quantum fluctuations of fuzzy supersphere.

Comments:	56 pages, no figures, two tables, references added, minor corrections, to appear in NPB
Subjects:	High Energy Physics - Theory (hep-th) ; Mathematical Physics (math-ph); Quantum Physics (quant-ph)
Journal reference:	Nucl.Phys. B 853 (2011) 777-827
Cite as:	arXiv:1106.5077 [hep-th]
	(or arXiv:1106.5077v2 [hep-th] for this version)

Submission history

From: Kazuki Hasebe [view email] [v1] Fri, 24 Jun 2011 22:28:06 GMT (41kb) [v2] Fri, 26 Aug 2011 09:00:52 GMT (42kb)

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