



Analysis and Geometry Seminar

A symmetry reduction problem in hyperkähler geometry

Joseph Malkoun (Notre Dame University, Louaize)

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Abstract. If a system of equations in dimension n is invariant under the action of a Lie group of dimension k , then the system of equations can be reduced to another one in dimension $n - k$. Such a reduction goes by the name of "symmetry reduction", or sometimes it is called "dimensional reduction". In this work, we are interested in a system of equations of Monge-Ampère type in dimension 8 describing the local geometry of a hyperkähler 8-manifold M . Under an abelian 2-dimensional Lie group G of symmetries, this system reduces to another system in dimension 6, which can be neatly written down using a Poisson bracket. This symmetry reduction problem differs from previous ones by the fact the Lie group G fixes a complex structure I , and rotates J and K . Such "rotating" actions have been recently studied by various authors, such as A. Haydys, N. Hitchin on the mathematical side, and by D. Butter and S.M. Kuzenko on the physics side, among others.