



*Institute of Mathematical Research
Department of Mathematics*

GEOMETRY SEMINAR

Deformation of the space of lines on the 5-dimensional hyperquadric

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Abstract

Let F^5 be the space of lines on the 5-dimensional hyperquadric $Q^5 \subset \mathbb{P}^6$. F^5 is a 7-dimensional homogeneous projective manifold. We show that a projective manifold which arises as a deformation of F^5 is biholomorphic to either F^5 itself or the G_2 -horospherical variety X^5 studied by Pasquier-Perrin. The key point of the proof is to show that a 7-dimensional Fano manifold of second Betti number 1 with the variety of minimal rational tangents isomorphic to a certain Hirzebruch surface is biholomorphic to X^5 . A main new ingredient in the proof is a study of the Cartanian geometry of the geometric structure determined by such a Hirzebruch surface: the construction of a Cartan connection and the investigation of its curvature. This geometric structure is associated to a non-reductive graded Lie algebra and has not been studied classically.

Date: August 5, 2010 (Thursday)

Time: 4:00 – 5:00pm

Place: Room 210, Run Run Shaw Bldg., HKU

All are welcome