

Lie Group and Representation Theory Seminar

Date: April 13 (Tue), 2004, 15:00–16:00

Place: RIMS 402

Speaker: Adam Koranyi (CUNY, USA)

Title: LIOUVILLE-TYPE THEOREMS IN PARABOLIC
GEOMETRY.

Abstract:

$G = O(n + 1, 1)$ acts on the n -sphere by conformal transformations. In 1850 Liouville proved that, for n at least 3, any smooth conformal map of an open subset of the sphere onto another one is the restriction of an element of G . In greater generality, let G be a simple real Lie group and $P = MAN$ a parabolic subgroup (In the case of the n -sphere, $M = O(n)$, $A = R$, $N = R^n$). Then the action of G on G/P is “multicontact” in the sense that it preserves a natural filtering of the tangent bundle induced by the root structure (in the sphere-case the filtering is trivial). It is also “conformal” in the sense that, in addition, the differential of the action at any point belongs to MA . In many cases (e.g. whenever P is non-maximal) the analogue of Liouville’s theorem holds for multicontact maps. In almost all cases it holds for “conformal” maps. A number of related results are known, most notably those proved by K. Yamaguchi, but the notion of multicontactness seems to be new. A very simple proof, not using connections or classification, will be given for the case of non-maximal P . This is joint work with M. Cowling, F. De Mari and H. M. Reimann.

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