SEMINÁRIO DE GEOMETRIA

Dia 12 Abril (sexta-feira), às 13h30, sala 6.2.33

A new integral invariant for hypersurfaces in space-forms

Rui Albuquerque

(Universidade de Évora | Centro de Investigação em Matemática e Aplicações)

Abstract:

We consider the total mean curvatures $\int_N H_i \,\mathrm{vol}$, $0 \leq i \leq n$,

$$H_i = \frac{1}{\binom{n}{i}} \sum_{1 \leq j_1 < \cdots < j_i \leq n} \lambda_{j_1} \cdots \lambda_{j_i},$$

λ_j being the principal curvatures of a hypersurface N immersed in a Riemannian manifold (M, g) of dimension $n+1$. In the case where M has constant sectional curvature c and n is even, we show a new integral quantity relating those curvatures which is a constant of the hypersurface N under C^2 deformations. We do not know what this constant represents.

We recall the Theorem of Chern-Gauss-Bonnet, which gives a topological integral invariant on the curvature of N, and prove with applications that the old and new invariants are not the same in case $c \neq 0$ (they are the same in Euclidean space). We further prove one interesting coincidence in the case of exactly two distinct principal curvatures with multiplicities $n-1$ and 1.

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