DIFFERENTIAL GEOMETRY/PDE SEMINAR

Wednesday, February 28, 2007
Padelford C-36
3:50-5pm

Conformal Killing symmetric tensor fields

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A conformal Killing vector field on a Riemannian manifold is a vector field generating a one-parameter group of conformal transformations. We generalize the differential equation of conformal Killing vector fields to symmetric tensor fields of arbitrary rank. The main result of the article is the finiteness theorem: the space of rank $m \geq 0$ conformal Killing tensor fields on a connected Riemannian manifold M has a finite dimension in the case of $n = \dim M \geq 3$. In the case of $n = 2$, a conformal Killing tensor field is uniquely determined by its C^∞-jet at an arbitrary point. A conformal Killing tensor field is identically equal to zero if it vanishes on a hypersurface. On using the latter fact, we prove a theorem on decomposition of a symmetric tensor field on a compact manifold with boundary to the sum of three fields of some special kind.

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