On some vanishing theorems of global character about geodesic mappings of complete Riemannian spaces

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Generalization of Bocher technique (see for example, [1]) allows to broad to the complete Riemannian spaces a lot of theorems of geodesic unique definiteness on the whole proved previousely only for the compact ones (see for example, [2]). It seems to be interesting to indicate some of them.

Theorem 1. *Complete Ricci semi-symmetric Riemannian C^r-spaces V^n ($n > 2$, $r > 4$) with positively definite metric form, Einstein tensor of which doesn't equal to zero, don't admit non-trivial (different from the affine) geodesic mappings on the whole.*

Theorem 2. *Complete Riemannian C^r-spaces V^n ($n > 2$, $r > 4$) with positively definite metric form and non-negative scalar curvature ($R \geq 0$) don't admit non-trivial (different from the affine) geodesic mappings on the whole.*

Theorem 3. *Complete Ricci semi-symmetric Riemannian C^r-spaces V^n ($n > 2$, $r > 4$) with positively definite Ricci form, Einstein tensor of which doesn't equal to zero, scalar curvature of which preserves its sign ($R \geq 0$ or $R \leq 0$ everywhere in V^n) don't admit non-trivial (different from the affine) geodesic mappings on the whole.*

Theorem 4. *Complete Ricci semi-symmetric Riemannian C^r-spaces V^n ($n > 2$, $r > 4$) with positively definite Einstein form don't admit non-trivial (different from the affine) geodesic mappings on the whole.*

Examples of Riemannian spaces of the considered types are known.

References

[1] Pigola S., Rigoli M., Setti A.G. *Vanishing in finitness results in geometric analysis.* in *A Generalization of the Bochner Technique.*, Berlin: Birkhauser Varlag AG, 2008

[2] Sinyukova, H.N. Geodesic uniqueness in the whole of some generally recurrent Riemannian spaces, *Jornal of Mathematical Sciences*, 177(2) : 710-715, 2010.