UDC 517.98

MATEMATICHESKIE TRUDY
2010, V. 13, N 1, 85–145

ON CONFORMAL KILLING SYMMETRIC TENSOR FIELDS ON RIEMANNIAN MANIFOLDS

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A vector field on Riemannian manifold is called *conformal Killing* if it generates one-parameter group of conformal transformation. The class of conformal Killing symmetric tensor fields of an arbitrary rank is a natural generalization of the class of conformal Killing vector fields, and appears in different geometric and physical problems. In this paper, we prove that a trace-free conformal Killing tensor field is identically zero if it vanishes on some hypersurface. This statement is a basis of the theorem on decomposition of a symmetric tensor field on a compact manifold with boundary to a sum of three fields of special types. We also establish triviality of the space of trace-free conformal Killing tensor fields on some closed manifolds.

Key words and phrases: Riemannian geometry, tensor analysis, conformal Killing tensor field.

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Received
August 24, 2009

Translated into English:
Siberian Advances in Mathematics, V. 21, N 1, 1–41 (2011).