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Abstracts of Short Communications and Posters

Section:

5. Differential Geometry and Global Analysis

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Geodesic equivalence and integrability
Let $G = (g_{ij})$ and $\hat{G} = (\hat{g}_{ij})$ be two smooth metrics on the same manifold M^n. They are *geodesically equivalent* if they have the same geodesics (considered as unparameterized curves).
We show that the existence of a (non-trivially) geodesically equivalent metric $\hat{G}$ allows us to construct canonically n commuting quadratic in velocities integrals of the geodesic flow of the metric G.
Corollary. Let M^n be a closed real-analytic manifold supplied with two real-analytic metrics $G, \hat{G}$ such that the metrics $G, \hat{G}$ are geodesicaly equivalent and strictly non-proportional almost everywhere. Then the fundamental group $\pi(M^n)$ of the manifold M^n contains an Abelian subgroup of finite index.