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REGULAR AND QUASIREGULAR ISOMETRIC FLOWS ON RIEMANNIAN MANIFOLDS

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We study the nontrivial Killing vector fields of constant length and the corresponding flows on smooth Riemannian manifolds. We describe the properties of the set of all points of finite (infinite) period for general isometric flows on Riemannian manifolds. It is shown that this flow is generated by an effective almost free isometric action of the group S^1 if there are no points of infinite or zero period. In the last case, the set of periods is at most countable and generates naturally an invariant stratification with closed totally geodesic strata; the union of all regular orbits is an open connected dense subset of full measure.

Key words and phrases: Riemannian manifold, Killing vector field, action of the circle, geodesic.

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