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	abstract	Our paper is devoted to the study of the holonomy groups of Finsler surfaces using the methods of infinite dimensional Lie theory. The notion of infinitesimal holonomy algebra will be introduced, by the smallest Lie algebra of vector fields on an indicatrix, containing the curvature vector fields and their horizontal covariant derivatives with respect to the Berwald connection. We obtain that the topological closure of the holonomy group contains the exponential image of any tangent Lie algebra of the holonomy group. A class of Randers surfaces is determined, for which the infinitesimal holonomy algebra coincides with the curvature algebra. We prove that for all projectively flat Randers surfaces of non-zero constant flag curvature the infinitesimal holonomy algebra has infinite dimension and hence the holonomy group cannot be a Lie group of finite dimension. Finally, in the case of the Funk metric we prove that the infinitesimal holonomy algebra is a dense subalgebra of the Lie algebra of the full diffeomorphism group and hence the topological closure of the holonomy group is the orientation preserving diffeomorphism group of the circle.	**abstract**	Our paper is devoted to the study of the holonomy groups of Finsler surfaces using the methods of infinite dimensional Lie theory. The notion of infinitesimal holonomy algebra will be introduced, by the smallest Lie algebra of vector fields on an indicatrix, containing the curvature vector fields and their horizontal covariant derivatives with respect to the Berwald connection. We obtain that the topological closure of the holonomy group contains the exponential image of any tangent Lie algebra of the holonomy group. A class of Randers surfaces is determined, for which the infinitesimal holonomy algebra coincides with the curvature algebra. We prove that for all projectively flat Randers surfaces of non-zero constant flag curvature the infinitesimal holonomy algebra has infinite dimension and hence the holonomy group cannot be a Lie group of finite dimension. Finally, in the case of the Funk metric we prove that the infinitesimal holonomy algebra is a dense subalgebra of the Lie algebra of the full diffeomorphism group and hence the topological closure of the holonomy group is the orientation preserving diffeomorphism group of the circle.		
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