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
Complete systems of differential invariants of vector fields in a euclidean space

of

Mathematics

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Abstract: The system of generators of the differential field of all G-invariant differential rational functions of a vector field in the n-dimensional Euclidean space R^n is described for groups $G=M(n)$ and $G=SM(n)$, where $M(n)$ is the group of all isometries of R^n and $SM(n)$ is the group of all euclidean motions of R^n . Using these results, vector field analogues of the first part of the Bonnet theorem for groups $Aff(n)$, $M(n)$, $SM(n)$ in R^n are obtained, where $Aff(n)$ is the group of all affine transformations of R^n . These analogues are given in terms of the first fundamental form and Christoffel symbols of a vector field.

Key Words: Vector field; Christoffel symbol; Bonnet theorem; Differential invariant

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