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Symmetries of vector exterior differential systems and the inverse problem in second-order Ostrograds′kii mechanics. (English summary)

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Let $F \to X$ be a vector bundle and $f: B \to X$ be a differentiable mapping. An exterior differential system $\mathfrak{S}$ with values in F is an $\mathcal{F}(B, \operatorname{End} F)$-submodule of $\mathcal{F}(B, F) = \Gamma(\bigwedge T^*B \otimes_B F)$. The germ of an immersion $\sigma: Z \to B$ is a solution of $\mathfrak{S}$ if $\sigma^*\mathfrak{S} = 0$. Two exterior differential systems $\mathfrak{S}$, $\mathfrak{S}'$ with values in $E \to B$, $E' \to B$, respectively, are equivalent [resp. algebraically equivalent] if the sets of their solutions coincide [resp. $\mathfrak{S}' \subset \mathfrak{S} \wedge \mathcal{F}(B, E^* \otimes E')$ and $\mathfrak{S} \subset \mathfrak{S}' \wedge \mathcal{F}(B, E'^* \otimes E)$]. For Pfaffian systems algebraic equivalence implies equivalence. Symmetries of the Euler-Lagrange equations of a Lagrangian are then interpreted in this terminology and the classical spinning particle is also analyzed.

{For the entire collection see MR1401564 (97b:00013)}

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