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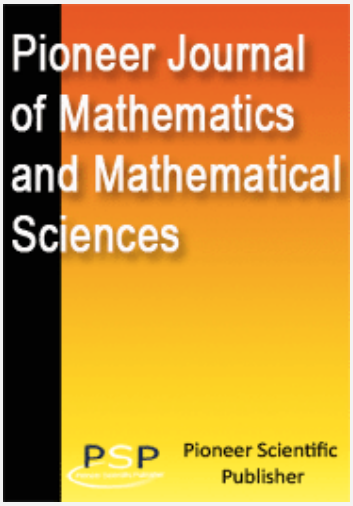

AN EXPLICIT FORM OF THE INDUCED LAGRANGIAN CONNECTION

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Abstract

In this paper, we define the induced lagrangian connection on submanifold of *TM*. Grifone [J. Grifone, Structure presque-tangente et connexions I, Ann. Inst. Fourier 22(1) (1972), 287-334] Klein [J. Klein, Espaces variationnels et mécanique, Thèse, Durand, Chartres, 1961] characterized in holonomic Lagrangian mechanics, the solutions of holonomic Lagrangian mechanics as geodesics of the Lagrangian connection constructed on the tangent bundle of finsler or Riemannian manifold. In non holonomic case, where the Euler-Lagrange system is defined with constraint as sub-manifold $\mathcal{A}$ of *TM*, we have characterized the solutions, by using the induced Lagrangian connection Γ Grifone and Mehdi [J. Grifone and M. Mehdi, On the geometry of Lagrangian mechanics with non-holonomic constraints, Journal of Geometry and Physics 30 (1999), 187-203], Vershik and Faddeev [A. M. Vershik and L. D. Faddeev, Differential Geometry and Lagrangian mechanis with constraints, Soviet. Phys. Dokl. 17 (1972), 34-36]. We have given the explicit form of this Lagrangian connection in Mehdi [M. Mehdi, An explicit form of Lagrangian connection, Pioneer J. Math. Math. Sci. 17(2) (2016), 113-125]. We prove in this paper the explicit form of all induced Lagrangian connection on admissible sub-manifold of tangent space where the spray of Γ^* is the induced spray on $\mathcal{A}$ and we give the explicit form of the induced connections on some examples of Heisenberg structures.

Keywords and phrases: connections, Heisenberg manifold, Lagrangian mechanics, fibre bundle, spray.