

Polysymplectic and Multisymplectic Geometry of Fiber Bundles

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Abstract

We consider the question: "What is the precise definition of a multisymplectic form?", that is, "What kind of general geometric structure is related to the De Donder-Weyl equations of classical field theories?". To answer this question we define the concept of a multisymplectic structure on a general fiber bundle over a general space-time manifold and prove a Darboux type theorem for the existence of canonical local coordinates. We also show that a polysymplectic structure arises naturally from a multissymplectic one.