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### **Higher Order Jet Bundles of Lie Group-Valued Functions**

For each positive integer  $k$ , the bundle of  $k$ -jets of functions from a smooth manifold,  $X$ , to a Lie group,  $G$ , is denoted by  $J^k(X, G)$  and it is canonically endowed with a Lie groupoid structure over  $X$ . In this work, we utilize a linear connection to trivialize this bundle, i.e., to build an injective bundle morphism from  $J^k(X, G)$  into a vector bundle over  $G$ . Afterwards, we give the explicit expression of the groupoid multiplication on the trivialized space, as well as the formula for the inverse element. In the last section, a coordinated chart on  $X$  is considered and the local expression of the trivialization is computed.

**Keywords:** Fiber bundle, Lie groupoid, jet bundle, partition, tensor product.

**MSC:** 22E30, 58A20, 22E60.