

Sprays and Cartan projective connections

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Abstract

Around 80 years ago, several authors (for instance H. Weyl, T.Y. Thomas, J. Douglas and J.H.C. Whitehead) studied the projective geometry of paths, using the methods of tensor calculus. The principal object of study was a spray, namely a homogeneous second-order differential equation, or more generally a projective equivalence class of sprays. At around the same time, E. Cartan studied the same topic from a different point of view, by imagining a projective space attached to a manifold, or, more generally, attached to a ‘manifold of elements’; the infinitesimal ‘glue’ may be interpreted in modern language as a Cartan projective connection on a principal bundle. This talk describes the geometrical relationship between these two points of view.