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Markus J Pflaum* (markus.pflaum@colorado.edu), Department of Mathematics, University of Colorado UCB 395, Boulder, CO 80305, and **Hessel Posthuma** and **Xiang Tang**. *Geometry of orbit spaces of proper lie groupoids.*

We study geometric properties of quotient spaces of proper Lie groupoids. It is shown how one can construct a natural stratification of such orbit spaces by using an extension of the slice theorem for proper Lie groupoids of Weinstein and Zung. Next, the existence of an appropriate metric on the groupoid giving the associated Lie algebroid the structure of a singular riemannian foliation is shown. With this metric, the orbit space inherits a natural length space structure. Moreover, we prove that the orbit space of a proper Lie groupoid can be triangulated. Finally, we derive a de Rham theorem for the complex of basic differential forms on a proper Lie groupoid. (Received September 20, 2011)