Differential Structure of Orbit Spaces: Erratum

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Abstract. This note signals an error in the above paper by giving a counter-example.

Theorem 5.4 and consequently Corollary 5.5 are incorrect as can be seen from the following example.

Let $G = \mathrm{SO}(2)$ act on $P = \mathbb{R}^2$ by rotations around the origin. The G-orbit space $\overline{P}$ is diffeomorphic to the half-line $[0, \infty)$, which is the union of two strata $\{0\}$ and $(0, \infty)$. The natural differential structure $C^\infty(\overline{P})$ of $\overline{P}$ can be described as the collection of functions on $[0, \infty) \subset \mathbb{R}$, which are restrictions of smooth functions on $\mathbb{R}$. The derivation $\frac{\partial}{\partial x}$ on $C^\infty(\mathbb{R})$ restricts to a derivation X on $C^\infty(\overline{P})$. Hence, $X(0) \in T_0\overline{P}$ and $X(0) \neq 0$. But $T_0\{0\} = 0$.

This error does not affect any other result in the paper.

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