EQUIVARIANT UNFOLDINGS OF STRATIFIED PSEUDOMANIFOLDS

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Abstract

The Intersection Cohomology with differential forms defined on stratified pseudomanifolds, introduced by Brasselet [1], Hector and Saralegi [5]; uses the unfolding given by Verona [7] as an auxiliary tool. Broadly speaking, an unfolding over a stratified pseudomanifold X is a smooth manifold $\widetilde{X}$ together with a continuous surjective map $\mathcal{L}_X : \widetilde{X} \to X$ such that the restriction to the regular part $\mathcal{L}_X : \mathcal{L}^{-1}(X - \Sigma) \to X - \Sigma$ is a finite trivial covering, and for each singular stratum S the restriction $\mathcal{L}_X : \mathcal{L}^{-1}(S) \to S$ is a smooth fiber bundle with fiber $\widetilde{L_S} \times \mathbb{R}$ where $\widetilde{L_S}$ is the unfolding of the link L_S of the stratum S. The recursive method employed here turns this construction more difficult when the length of X is ≥ 1. In this work we introduce a class $\mathfrak{G}$ of G-transverse Thom-Mather stratified pseudomanifolds. An object of $\mathfrak{G}$ is an unfoldable stratified pseudomanifold X with arbitrary length, endowed with the action of a compact Lie group G such that the stratification of X is a refinement of the partition by orbit types (namely, the isotropy groups are constant over each stratum) and where the local conical structure is given by a slice of the action. Besides, we ask the stratification of X to be Thom-Mather compatible with the action, so there are equivariant tubular neighborhoods over the singular strata and these tubes are locally transverse to the action.

A fundamental property is that for any object $X \in \mathfrak{G}$ and $K \subset G$ a closed subgroup, the quotient space X/K is a G/K-transverse Thom-Mather stratified pseudomanifold, the quotient stratification being induced by the natural projection map. Since each smooth G-manifold is an object in $\mathfrak{G}$, this fact provides a rich source of examples of unfoldable stratified pseudomanifolds wich can be obtained starting on a smooth manifold.

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