

Contractions versus extensions of holonomy maps of foliations and applications

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Consider a singular holomorphic foliation \mathcal{F} on a projective surface. Over the leaves of \mathcal{F} we can define real trajectories over which the parallel transport of \mathcal{F} yields a contraction for a natural way of measuring the distance between two leaves. These real trajectories can also be seen as a singular real foliation denoted by \mathcal{H} and, among the possible singularities of \mathcal{H} , there are "sources" (resp. "sinks") corresponding to a point of local maximum (resp. minimum) for the distance between two leaves of \mathcal{F} . In turn, these types of singularities lead to the notion of endpoints for a given trajectory. It is then natural to consider foliations \mathcal{H} containing a trajectory of "infinite length" and foliations \mathcal{H} all of whose trajectories are of "finite length". In the first case we are going to show the presence of a suitable "contraction" (modulo ramification and a few other minor issues). In the remaining case, we are going to provide some general statements concerning the possibility of extending holonomy maps of among different transverse sections for \mathcal{F} . We shall then indicate some applications of these results.