# STABILIZERS OF MORSE-BOTT FUNCTIONS ON SURFACES AND THEIR HOMOTOPY TYPE

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Let $M$ be a smooth compact surface, $P$ be either $\mathbb{R}$ or $S^1$, and $\mathcal{D}(M)$ be a group of $C^\infty$-diffeomorphisms of $M$. For a smooth function $f \in C^\infty(M, P)$ we denote by $\mathcal{S}(f)$ the stabilizer of $f$, i.e., a subgroup of $\mathcal{D}(M)$ of $f$-preserving diffeomorphisms of $M$, and by $\mathcal{S}_{\mathrm{id}}(f)$ a connected component of the identity map of the group $\mathcal{S}(f)$.

The report will be devoted to the description of the homotopy type of $\mathcal{S}_{\mathrm{id}}(f)$ for $P$-valued Morse-Bott functions on surfaces. We proved that $\mathcal{S}_{\mathrm{id}}(f)$ is contractible if $f$ has at least one saddle point or $M$ is non-oriented, and to $S^1$ otherwise. Moreover, the result holds for some larger class of smooth functions, see [1].

1. Feshchenko B., Homotopy type of stabilizers of circle-valued functions with non-isolated singularities on surfaces, arXiv:2305.08255