

FRAGMENTATIONS OF THE SECOND KIND IN SOME DIFFEOMORPHISM GROUPS

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Let $G(M) \subset \text{Diff}^r(M)$ be a diffeomorphism group, and $G_c(M)_0$ be its compactly supported identity component. Suppose that for an isotopy f_t in $G_c(M)_0$ with $\text{supp}(f_t) \subset \bigcup_{i=1}^k U_i$, U_i are open, there exist isotopies $f_{j,t}$ in $G_c(M)_0$, $j = 1, \dots, l$, with $f_t = f_{1,t} \circ \dots \circ f_{l,t}$ such that $\text{supp}(f_{j,t}) \subset U_{i(j)}$ for all j . Then $G(M)$ is said to satisfy a fragmentation property of the *first kind*.

Our idea is to introduce also the *second kind* of fragmentations. Such fragmentations are considered only for isotopies and diffeomorphisms in a sufficiently small C^1 -neighborhood of the identity in the group $G_c(\mathbb{R}^n)_0$. On the other hand, we claim that the factors of the fragmentation are uniquely defined by the initial diffeomorphism and that the C^r -norms of the factors are controlled in a convenient way by the C^r -norms of the initial diffeomorphism.

In proofs of some theorems on the simplicity and perfectness of diffeomorphism groups a clue role is played by both kinds of fragmentation properties. Here we consider fragmentations of both kinds for symplectomorphisms and contactomorphisms.