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On (non-)embeddability of knot groups into the group of diffeomorphisms of compact 1-manifolds

For a compact 1-manifold M^1 , we study the embeddability question of knot groups into the group $\text{Diff}_+^r(M^1)$ where $r \in \mathbb{N} \cup \{\infty, \omega\}$. It is well known that every knot group embeds in $\text{Homeo}_+(M^1)$ while the question for higher regularities remains mostly unexplored. Recently, some progresses are made (by numerous authors) in the embeddability questions of surface groups and RAAGs.

For both the circle \mathbb{S}^1 and the closed interval $I \cong [0, 1]$, in the case of $r = \omega$ we provide a complete classification while for $r \geq 2$, we prove both positive and negative results for various classes and examples of knots. This is a joint work with Cody Martin.