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Smooth flows with fractional entropy dimension

The fractional entropy dimension of a smooth flow, as introduced by Katok and Thouvenot, is a measure of the chaotic behavior of the flow at intermediate growth rates, between 0 and 1. A flow with positive topological entropy has entropy dimension equal to 1, while an isometric flow has entropy dimension zero. The aperiodic flows on compact 3-manifolds obtained via the celebrated construction of Krystyna Kuperberg, and called Kuperberg flows, necessarily have zero topological entropy by a theorem of Katok. In the study of the dynamics of these flows by Ana Rechtman and the presenter, it was shown that a generic Kuperberg flow has entropy dimension at least $1/2$. In this work, I will show how to construct non-generic smooth Kuperberg flows which have entropy dimension 0 ¡ d ¡ $1/2$, where d can be chosen arbitrarily small. We also state a conjecture relating the entropy dimension with the unstable shape properties of the unique minimal set.