

# *LS*-category of moment-angle manifolds and Massey products

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We give various bounds for the Lusternik-Schnirelmann category of moment-angle complexes  $\mathcal{Z}_K$  and show how this relates to vanishing of Massey products in  $H^*(\mathcal{Z}_K)$ . In particular, we characterise the Lusternik-Schnirelmann category of moment-angle manifolds  $\mathcal{Z}_K$  over triangulated  $d$ -spheres  $K$  for  $d \leq 2$ , as well as higher dimension spheres built up via connected sum, join, and vertex doubling operations. This characterisation is given in terms of the combinatorics of  $K$ , the cup product length of  $H^*(\mathcal{Z}_K)$ , as well as a certain Massey products. Some of the applications include calculations of the Lusternik-Schnirelmann category and the description of conditions for vanishing of Massey products for moment-angle complexes over fullerenes and  $k$ -neighbourly complexes.