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Topological stable rank of Banach algebras

25 years ago, Rieffel introduced an algebraic invariant for Banach algebras called *topological stable rank* which generalized the notion of dimension to the non-commutative setting. For example, if X is a compact Hausdorff space of dimension n, then $\mathrm{tsr}\big(C_{\mathbb{R}}(X)\big) = n$ and with complex scalars $\mathrm{tsr}\big(C(X)\big) = \lfloor n/2 \rfloor + 1$. The topological stable rank has a left and right version, which coincide for C^*-algebras and commutative algebras. Moreover, tsr is a Banach algebra variant of the purely algebraic invariant of Bass stable rank for rings—and the left and right versions of Bass stable rank are always equal. So Rieffel asked whether they are always equal?

We have calculated the left and right topological stable ranks for the class of nest algebras, and can answer Rieffel's question negatively.