UNITARY EMBEDDINGS OF FINITE LOOP SPACES

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Abstract. Benson, Greenlees and Shamir introduced the notion of a normalizable space at a prime p. It is a space which admits a complex homotopy monomorphism, that is, a map into the $BU(n)^\wedge_p$ for some n whose homotopy fibre is $\mathbb{F}_p$-finite. Classical examples come from finite groups and compact Lie groups. General arguments show that the mod p cohomology of a normalizable space is Noetherian.

In this project we construct faithful representations of saturated fusion systems over discrete p-toral groups and use them to find conditions that guarantee the existence of homotopy monomorphisms from p-local compact groups (introduced by Broto, Levi and Oliver) to p-completed unitary groups. We then show that some exotic p-local compact groups are normalizable. In general, the p-completion of a finite loop space is normalizable. Some properties of the cohomology of the classifying space of a p-local compact group follow.

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