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 \( BU(n)_p \) 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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