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Formation of novel topological liquids in non-Abelian quantum Hall states with a finite density of interacting anyons SIMON TREBST, Microsoft Research, Station Q, CHARLOTTE GILS, ETH Zurich, EDDY ARDONNE, Nordita, ANDREAS W. W. LUDWIG, UC Santa Barbara, MATTHIAS TROYER, ETH Zurich, ZHENGHAN WANG, Microsoft Research, Station Q — We discuss the nucleation of novel topological liquids within a 'parent' non-Abelian quantum Hall state that arises from a macroscopic occupation of the parent liquid with interacting anyons. The edge states between the 'nucleated' and the 'parent' liquids are neutral, and correspond precisely to the gapless modes of chains of interacting anyons. Exploring the collective states of anyonic spin chains is thus, at the same time, a tool to systematically study topological phases which can occur inside non-Abelian quantum Hall liquids due to population of such liquids with a finite density of interacting non-Abelian anyons. We discuss several examples including the interface between the Moore-Read and Read-Rezayi quantum Hall states.

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