Dear Editor,

We wish to thank the referee for reviewing our paper and finding our results to be interesting and a nice addition to the existing literature. Below, we address the referee's comment comment and request concerning a comparison with Ref. [15].

Sincerely,

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Detailed Reply to the Referee:

** I find the paper interesting and a nice addition to the line of investigation pursued by the authors. But it remains unclear to me whether the work meets the novelty standards of SciPost Physics. In particular in comparison with Ref.[15].*

Response: Frankly, there is very little overlap between Ref. [15] and the current paper. The foci of these two works are rather different. While there is some overlap in the mathematical tools used, both papers address notably different aspects of quantum Hall physics. Ref. [15] studied the problem of establishing the parent Hamiltonian for Jain's composite fermion sequence of exclusively *abelian* fluids. The current paper focuses primarily on stabilizing and constructing edge excitations for *non-abelian* fluids, such as the $SU(2)_3$ model leading to Fibonacci anyons which enable universal topological quantum computation. The general framework that we advance in the current manuscript allows us to generate topological fluids with arbitrary filling fraction. These states lie far beyond the scope of Jain's sequence.

Heeding the referee's request, in the below, we highlight some of the most prominent differences that underscore the novelty of our work.

1. In Ref. [15], we simply proposed a Hamiltonian for Jain's composite fermions. In the current manuscript (Sec II), we discuss the systematic generation of two-body Hamiltonians with M-clustering properties for different filling fractions. In Sec II(C), we concentrate on a particular case that we expand on throughout the manuscript. Most importantly, the Hamiltonians discussed in Ref. [15] do not belong to the class of Hamiltonians developed in the current manuscript.

2. In Sec III, we establish the Entangled Pauli Principle (EPP) for general (non-abelian) fluids in terms of a pseudospin algebra which provides unique physical insight on the complex entanglement structure of the topological ground states. These insights help us identify a very rich tensor network structure in the root state components of those ground states. Such tensor network structure cannot possibly be constructed for the abelian composite fermions of Ref. [15]. We further expand this notion in Sec VI(A).

3. In Sec IV (the longest section of the paper), we combine the idea of root-level entanglement with the developed notion of S-duality in order to extract the nonabelian edge physics supporting Fibonacci-type anyons. In Ref. [15], focusing on abelian fluids, such a (mathematically involved) analysis would be entirely superfluous.

4. In Sec V, we make a general connection between parton-like states and the zero modes of parent (frustration-free) Hamiltonians. We develop the mathematical theory of (non-holomorphic) multivariate polynomials with M-clustering properties. This development can be compared to the one made by Feigin, Jimbo, Miwa, and Mukhin in which they focused on Jack polynomials. Most importantly, for future numerical simulations, we conjecture parton-like states to form a basis of the zero more subspace (different from a Slater determinant basis). This result may stimulate applications to complex simulations of strongly interacting fermion systems without a Fermi surface (non-Fermi liquids).

5. In Sec VI, besides proving that root states can be cast in terms of matrix product states, we develop new tools to construct root states from partons and vice-versa.

We reiterate that these items are only some of the important differences with Ref. [15]. In the revised version of our manuscript, we placed further emphasis on the fact that Ref. [15] is only about abelian phases.