# Wavefunctions for Anyon Superconductors

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Motivated by the recent observation of superconductivity in twisted bilayer $MoTe_2$, anyon superconductivity has attracted renewed theoretical interest. While most existing approaches rely primarily on field-theoretic descriptions, here we present a systematic construction of ideal wavefunctions for anyon superconductors in the form of quantum Hall hierarchy wavefunctions [1], building on a recently identified correspondence between anyon superconductivity and quantum Hall hierarchy states [2]. We establish the superconducting character of these wavefunctions through both a plasma analogy and a topological field-theory interpretation. Our construction applies to Abelian and non-Abelian superconductors emerging from a broad range of parent topological orders, including semion topological order including the 2/3-filling fractional Chern insulators, and even non-Abelian Pfaffian states. Finally, we clarify how our construction is related to the classic anyon superconductor wavefunctions proposed by Laughlin [3].

[1] Donghae Seo, Taegon Lee, and Gil Young Cho, work in progress

[2] Donghae Seo, Taegon Lee, and Gil Young Cho, Arxiv: 2602.09542

[3] R.B. Laughlin, Physical Review Letters 60, 2677 (1988)