Screening properties and phase transitions in unconventional plasmas for Ising-type quantum Hall states\textsuperscript{1} EGIL V. HERLAND, Norwegian University of Science and Technology, EGOR BABADEV, UMass Amherst and KTH Stockholm, PARSA BONDERSON, Microsoft Research, Station Q, VICTOR GU-RARIE, University of Colorado, Boulder, CHETAN NAYAK, Microsoft Research, Station Q and University of California, Santa Barbara, ASLE SUDBO, Norwegian University of Science and Technology — Utilizing large-scale Monte-Carlo simulations, we investigate an unconventional two-component classical plasma in two dimensions that interacts with two different Coulomb interactions. This plasma controls the behavior of the norms and overlaps of the quantum-mechanical wavefunctions of Ising-type quantum Hall states. It also relates to a model for a rotating two-component Bose-Einstein condensate with an Andreev-Bashkin drag interaction. The plasma differs fundamentally from that which is associated with the two-dimensional XY model and Abelian fractional quantum Hall states. We find that this unconventional plasma undergoes a Berezinskii-Kosterlitz-Thouless phase transition from an insulator to a metal and that the parameter values corresponding to Ising-type quantum Hall states lie on the metallic side of this transition. This result verifies the required properties of the unconventional plasma used to demonstrate that Ising-type quantum Hall states possess quasiparticles with non-Abelian braiding statistics.

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