Phase diagram of Bose-Fermi mixtures in one-dimensional optical lattices LODE POLLET, MATTHIAS TROYER, Institut Theoretische Physik, ETH Zurich, CH - 8093 Zurich, Switzerland, KRIS VAN HOUCKE, STEFAN ROMBOUTS, Subatomaire en Stralingsfysica, Universiteit Gent, B - 9000 Gent, Belgium — The ground state phase diagram of the one-dimensional Bose-Fermi Hubbard model is studied in the canonical ensemble using a quantum Monte Carlo method. We focus on the case where both species have half filling in order to maximize the pairing correlations between the bosons and the fermions. In case of equal hopping we distinguish between phase separation, a Luttinger liquid phase and a phase characterized by strong singlet pairing between the species. True long-range charge density waves exist with unequal hopping strengths.

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