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Molecular superfluid phase in one-dimensional multicomponent fermionic cold atoms¹ GUILLAUME ROUX, LPT, IRSAMC, CNRS, Université Paul Sabatier, Toulouse, France and Institut für theoretische Physik C, RWTH Aachen, SYLVAIN CAPPONI, LPT, IRSAMC, CNRS, Université Paul Sabatier, Toulouse, France, PHILIPPE LECHEMINANT, LPTM, Université de Cergy-Pontoise, CNRS, France, PATRICK AZARIA, LPTMC, Université Pierre et Marie Curie, CNRS, Paris, France, EDOUARD BOULAT, LMPQ, Université Paris Diderot - Paris 7, CNRS, France, STEVEN R. WHITE, Department of Physics and Astronomy, University of California, Irvine, USA — We study a simple model of N -component fermions with contact interactions which describes fermionic atoms with $N = 2F + 1$ hyperfine states loaded into a one-dimensional optical lattice. We show by means of analytical and numerical approaches that, for attractive interaction, a quasi-long-range molecular superfluid phase emerges at low density. In such a phase, the pairing instability is strongly suppressed and the leading instability is formed from bound-states made of N fermions.

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