

Abstract Submitted
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Density functional theory for fermionic atom gases MATTHIAS TROYER, PING NANG MA, SEBASTIANO PILATI, ETH Zurich, XI DAI, Chinese Academy of Sciences — We will show how Kohn-Sham density-functional theory (DFT), which forms the basis of most electronic structure calculations in material science, can be applied to ultracold atomic gases in optical lattices. We present the derivation of an exchange correlation functional for atomic gases and show first applications within a local spin density approximation. In particular we will show that the local density approximation in DFT is much more accurate than what is commonly referred to as “local density approximation” in the atomic gases community. As an outlook we will discuss how the development of DFT for ultracold atomic gases can form a strong link between materials science and atomic physics.

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