

Abstract Submitted  
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**Effect of spin fluctuations on quasiparticles in simple metals**<sup>1</sup> JOHANNES LISCHNER, Lawrence Berkeley National Laboratory, TIMUR BAZHIROV, UC Berkeley, ALLAN MACDONALD, UT Austin, MARVIN COHEN, UC Berkeley, STEVEN LOUIE, UC Berkeley and Lawrence Berkeley National Laboratory — We present a first-principles theory for quasiparticle excitations in condensed matter systems that includes their interaction with spin fluctuations. We apply this theory to sodium and lithium. Despite several previous studies, the importance of spin fluctuations in these materials and, in particular, their effect on the occupied band width remains unclear. We show that the coupling to spin fluctuations does not significantly change the occupied band width, but gives an important contribution to the quasiparticle lifetime. To obtain quantitative agreement with experiment for the occupied band width, we find that it is necessary to include vertex corrections beyond the random-phase approximation in the screening by charge fluctuations.

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