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Spin excitations in a layered antiferromagnetic metal WENYA ROWE, Department of Physics, University of Florida, Gainesville, FL, JOHANNES KNOLLE, Max-Planck-Institut für Physik komplexer System, D-01187 Dresden, Germany, ILYA EREMIN, Institute für Theoretische Physik III, Ruhr-Universität Bochum, D-44801 Bochum, Germany, PETER HIRSCHFELD, Department of Physics, University of Florida, Gainesville, FL — The proximity of antiferromagnetic order in high-temperature superconducting materials is considered a possible clue to the electronic excitations which form superconducting pairs. Here we study the transverse and longitudinal spin excitation spectrum in a one-band model in the pure spin density wave (SDW) state and in the coexistence state of SDW and superconductivity. We start from a Stoner insulator which is similar to the case of cuprate parent compounds. By changing the chemical potential and the SDW order parameter, we study the evolution of the spectrum with different Fermi surfaces, such as the one with only hole pockets, with only electron pockets and with pockets of both types. We also compute the spin excitations in the coexistence of the AF and d-wave superconductivity, motivated by electron-doped cuprates.

Wenya Rowe
Department of Physics, University of Florida, Gainesville, FL

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