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Magnetic excitations in iron pnictides VLADIMIR ANTROPOV, Ames Laboratory, Ames, IA, USA, LIQIN KE, TAKAO KOTANI, MARK VAN SCHILFGAARDE, Arizona State University, Tempe, AZ, USA — We analyze the dynamical spin susceptibility $\chi(\mathbf{q}, \omega)$ in the iron pnictides: FeSe, CaFe2As2 and SrFe2As2 and obtain the spectra of spin excitations. In the longwavelength limit we obtain parameters for the adiabatic Heisenberg model and compare it with parameters generated by a static response method. Antiferromagnons are found for a small q, while for the larger q strong Stoner excitations are developed. These results support the claim that iron pnictides are marginally itinerant systems. We also estimate zero-point fluctuations from χ and find the following contributing mechanisms: adiabatic spin waves, hole-particle Stoner excitations and longitudinal fluctuations. Taking these effects into account improves the agreement between theory and experiment and indicate the importance of itinerant spin fluctuations.

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