Construction of transition matrix elements for the scattering of crystal electrons at magnons

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The scattering of crystal electrons at magnons in itinerant magnets is very important for the fields of spintronics and magnonics, and therefore an ab-initio treatment of these processes is highly desirable. The transition matrix elements for these scattering events are constructed in a second quantization formalism for crystal electron states which are represented by linear-muffin-tin-orbital basis functions. The exchange parameter appearing in these matrix elements is related to the exchange-correlation potential matrix of the spin-density functional theory. A comparison with the theory of electron-phonon scattering in magnets is made.