We will discuss now the three-dimensional realizations of momentum.

\[ F(q) = -\chi(q, \omega = 0), \]

where \( F(q) \) is the static response function at momentum \( q \), \( \chi(q, \omega) \) is the dynamical response function, and \( \omega = 0 \) corresponds to zero energy transfer.

FIG. 1: (Color online) Momentum dependence of the d-dimensional static response functions, \( F(q) = -\chi(q, \omega = 0) \), corresponding to zero energy transfer, \( \omega = 0 \). Here, momenta are expressed in rescaled units, i.e. in units of the Fermi momentum, \( k_F \).
Kohn anomalies in 1D systems

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Lattice Dynamics and Electron-Phonon Interaction in (3,3) Carbon Nanotubes

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FIG. 1 (color). Band structure of MgB2. Green and blue cylinders (hollow) come from the bonding pz bands, the blue tubular network (hollow) from the bonding pz bands, and the red (electronlike) tubular network from the antibonding px band. The last two surfaces touch at the K point.

FIG. 3 (color online). Phonon dispersion curves for the two symmetry classes which are affected by electron-phonon coupling. Shown are results obtained on a fine q grid and for a small effective temperature of 137 K.

Kohn anomalies in quasi 2D systems: MgB2

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Adiabatic and nonadiabatic phonon dispersion in a Wannier function approach

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FIG. 3 (color). The Fermi surface of MgB2. Green and blue cylinders (hollow) come from the bonding pz bands, the blue tubular network (hollow) from the bonding pz bands, and the red (electronlike) tubular network from the antibonding px band. The last two surfaces touch at the K point.