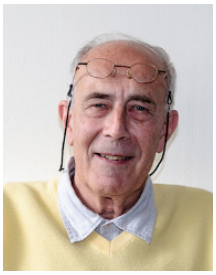

ID de Contribution: **197** Type: **Poster**

Static self energy and effecive mass of the homogeneous electron gas from Quantum Monte Carlo calculations

mardi 21 mars 2023 17:30 (1h 30m)

Landau's Fermi liquid theory has provided a paradigmatic frame for the phenomenological description of equilibrium and transport properties of degenerate fermions in terms of very few characteristic parameters. Silin has set out the path to generalize for long-range forces, such to extend it for normal metals in condensed matter. Although the formal structure of the underlying microscopic theory is known for a long time, most explicit calculations of the Fermi liquid parameters basically rely on approximative, perturbative schemes. As diagrammatic perturbation theory is not expected to converge for typical electronic densities, basic Fermi liquid parameters of the homogeneous electron gas (jellium), like the effective mass m^* and the renormalization factor Z, considerably vary according to the underlying approximation. Recently, diagrammatic Monte Carlo calculations (DiaQMC) [1] have been performed to include and control higher order terms of the perturbation series. Those calculations found an overall agreement for Z with previous quantum Monte Carlo calculations (QMC) [2]. However, DiaQMC results on m^* have been strongly questioned by QMC calculations yielding substantial different values [3]. Here, we rewise the methodology of zero temperature QMC calculations of the effective mass, in order to resolve the discrepancy between QMC and perturbative/DiaQMC results.

[1] K. Haule and K. Chen, Scientific Reports 12, 2294 (2022).
[2] M. Holzmann, B. Bernu, C. Pierleoni, J. McMinis, D. M. Ceperley, V. Olevano, and L. Delle Site, Phys. Rev. Lett.
107, 110402 (2011).
[3] S. Azadi, N.D. Drummond, and W.M.C. Foulkes, Phys. Rev. Lett. 127, 086401 (2021).

Auteur principal: Dr HOLZMANN, Markus (LPMMC, Grenoble)

Orateur: Dr HOLZMANN, Markus (LPMMC, Grenoble)

Classification de Session: Cocktail & Poster session

Classification de thématique: Many-body