



	Experiment title: Dynamic correlation effects in electron gas	Experiment number: HE-1793
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Shifts: 21	Local contact(s): S. Huotari	<i>Received at ESRF:</i>
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Report:

The results of this experiment have been published in [C. Sternemann](#), [S. Huotari](#), [G. Vankó](#), [M. Volmer](#), [G. Monaco](#), [A. Gusarov](#), [H. Lustfeld](#), [K. Sturm](#), and [W. Schülke](#): "*Correlation-Induced Double-Plasmon Excitation in Simple Metals Studied by Inelastic X-Ray Scattering*", Physical Review Letters **95**, 157401 (2005)

Abstract:

We report a new type of peaklike structure observed in the tail of the dynamic structure factor of simple metals, measured by inelastic x-ray scattering. Based on the momentum-transfer dependence of the energy position and the intensity of this structure, it has been unambiguously attributed to *intrinsic* plasmon-plasmon excitations, an electronic correlation effect that was theoretically predicted by many-body perturbation theory of the homogeneous-electron-gas model beyond the random-phase approximation. This signature appears to be largely unaffected by electron-ion interaction effects. Thus a structure that is primarily caused by correlation effects in the electron gas has been found experimentally in the dynamic structure factor of simple metals.

