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Discontinuity of the dielectric function at Bragg reflexes R. HAMBACH, C. GIORGETTI, F. SOTTILE, L. REINING, LSI, CEA-CNRS UMR 7642-Ecole Polytechnique, France and ETSF France, N. HIRAOKA, Y.Q. CAI, National Synchrotron Radiation Research Center, Hsinchu 30076, Taiwan, A.G. MARINOPOULOS, Department of Physics and Astronomy, Vanderbilt University, Nashville, USA, F. BECHSTEDT, IFTO, Friedrich-Schiller Universitaet Jena, Germany — As an example for layered materials, the loss function of graphite was studied for momentum transfers q beyond the first Brillouin zone. Surprisingly, near Bragg reflexes, the spectra are highly dependent on very small changes in q , which reminds the non-analyticity of the loss function in the optical limit ($q \rightarrow 0$). The effect is investigated by means of first principle calculations within the random phase approximation (RPA) and is confirmed by inelastic x-ray spectroscopy (IXS) measurements. We find crystal local field effects to be crucial and propose a simple 2×2 model dielectric function for explanation.

Ralf Hambach
LSI, CEA-CNRS UMR 7642-Ecole Polytechnique, France and ETSF France

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