Abstract Submitted
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**Anisotropic Electronic Screening due to Fermi Surface Nesting in Graphite**[1] JAMES REED, University of Illinois, YOUNG IL JOE, DIEGO CASA, THOMAS GOG, Y. Q. CAI, PETER ABBAMONTE — We used inelastic X-ray scattering to measure the imaginary part of the density-density Green's function, $\mathrm{Im}[\chi(\vec{k};\omega)]$, of a single crystal graphite sample along six direction in the Basal plane from [100] to [110]. To place $\mathrm{Im}[\chi(\vec{k};\omega)]$ on an absolute scale we calculate a scaling coefficient using the optical sum rule. The real part of $\chi(\vec{k};\omega)$ is calculated via the Kramers-Kronig transformation. We use an inversion algorithm to map the data into real space at various time intervals with attosecond time resolution. The images of the density response we produced show hexagonal anisotropy, which arises from scattering between the K and K' points of the Brillouin zone. Analysis of the data at $\omega = 0$ provides us with the anisotripic induced electron density around a static impurity as function of distance. Integration of the local density around $\vec{r} = 0$ gives the effective charge of the impurity from which we deduced the background dielectric constant, $\epsilon_\infty$, to be approximately 2.23.

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