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【606】 Optical probe of correlations in rare-earth nickelates films

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We used reflectometry and ellipsometry to investigate electronic properties of rare-earth nickelate films. We study the temperature dependence of the optical conductivity as chemical composition and strain varies close to charge and magnetic ordering temperatures.

The optical spectra show a characteristic two-peak structure when the material switches from metal to insulator that DMFT associates with a combined effect of bond disproportionation and Mott physics.

At magnetic ordering temperature, the spectral weight increases in these two peaks. Landau model with coupled charge and magnetic order parameters, indicates that charge order is required to the emergence of a long range magnetic order. Through a positive feedback, magnetic order stabilizes the charge order.

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