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The Pseudogap and the Unusual Excitations in the Optical Conductivity of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Material

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Highlights

- In the underdoped to optimally doped regime, the pseudogap is observed in the optical conductivity spectra.
- In the overdoped regime the pseudogap completely disappears. In the overdoped regime the optical conductivity behaves almost like the Drude conductivity of conventional metals.
- The data obtained in the overdoped regime has a good agreement with the experimental data. Even the trends like the cross-over region and pseudogap signature in the optical conductivity data were recovered by this model.
- The optical conductivity in the normal state is dominated by a pseudogap feature, whereas in the superconducting state it is dominated by unusual excitation.

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