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Nonperturbative Enhancement of Inelastic Photoemission Delay in Metals: Comparison with Correlated Insulators

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Proposing a theoretical model enabling nonperturbative treatment of core-level photoemission of metallic systems, we could properly account for extrinsic plasmon losses and determine the corresponding photoemission delays. This is the first-time exploration of inelastic photoemission delays of higher order plasmon satellites beyond the lowest order and then gives a route to manipulate the photoemission delay especially in metallic nanostructures showing strong higher order plasmon sidebands. Finally, we compare the physics of photoemission delay in a metal with that of a correlated insulator $CuCl_2$. We indicate that the key difference between two systems should be in the extendedness of screening of the created hole. This finding guides to a new realm of attosecond electron dynamics of correlated electron systems.

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