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Controlling Auger decay with electromagnetically induced transparency for x rays[1] ANTONIO PICON, GILLES DOUMY, STEPHEN SOUTHWORTH, LINDA YOUNG, CHRISTIAN BUTH, Argonne National Laboratory — The emerging x-ray free electron lasers (FELs) such as the Linac Coherent Light Source (LCLS) at SLAC National Accelerator Laboratory can reach very high intensities and ultrashort pulse durations. We analyze how to control Auger decay using a secondary intense near-infrared (NIR) laser with electromagnetically induced transparency for x rays. A three-level Λ-type model is used, where a core electron is coupled to a Rydberg state by the x rays while the NIR pulse couples the Rydberg states among each other. We use the model to predict the Auger electron spectrum of a neon atom and thus enhance our understanding and control of electron correlations. This work opens up new prospects to study and control the nonlinear interaction of ultraintense and ultrashort x rays with atoms.

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