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Lifetimes for fast charge transfer of core excited molecules on gold and graphene GIAN PAOLO BRIVIO, ETSF, CNISM, Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Milano, Italy, GUIDO FRATESI, ETSF, CNISM, Dip. di Fisica, Università di Milano, Milano, Italy, and Dip. di Scienza dei Materiali, Milano-Bicocca, Milano, Italy, HE LIN, ABHILASH RAVIKUMAR, Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Milano, Italy, OLGUN ADAK, LATHA VENKATARAMAN, Department of Applied Physics, Columbia University, NY, GREGOR KLADNIK, DEAN CVETKO, Physics department, Faculty for mathematics and physics, University of Ljubljana, Ljubljana, Slovenia, and CNR-IOM, Laboratorio TASC, Trieste, Italy, ALBERTO MORGANTE, CNR-IOM, Laboratorio TASC, Trieste, Italy and Department of Physics, University of Trieste, Trieste, Italy — The charge transfer time from an excited organic molecule both adsorbed on gold and graphene is studied in terms of the resonant linewidth of the molecular orbital energy levels interacting with the valence band of the substrate. The calculations are performed by density functional theory including the van der Waals contribution. Experiments are carried out by the core level resonant spectroscopies with fs resolution. The core valence exciton is described by a static perturbation of the atomic potential. The calculated widths are consistent with the experimental transfer times. They display a dependence on the molecular adsorption angle both in theory and experiments, and this effect is predicted to be function of the excited orbital.

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