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Exploring Photoswitchable Plasmon-Molecule Interactions at the Single-Molecule and Single-Nanoparticle Levels MINGSONG WANG, Department of Mechanical Engineering, The University of Texas at Austin, BHARATH BANGALORE RAJEEVA, Materials Science and Engineering Program, The University of Texas at Austin, YUEBING ZHENG, Department of Mechanical Engineering and Materials Science and Engineering Program, The University of Texas at Austin — Through synergizing the responsiveness of functional molecules and the plasmon-assisted nanoscale localization of light, hybrid nanosystems consisting of molecules and metal nanoparticle have important applications in biochemical detection, drug delivery, and energy conversion. Single-molecule and single-nanoparticle studies of the hybrid nanosystems help eliminate the inevitable heterogeneity from ensemble measurements and provide new insights into the structure-property relations. Along this line, herein, we report our recent advances in designing, measuring and controlling two types of photoswitchable metal-nanoparticle-molecule nanosystems at the single-molecule and single-nanoparticle levels: (1) azobenzene molecules on single metal nanoparticles; and (2) spiropyran molecules on single metal nanoparticles.

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