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Quantum open systems approach to single-molecule devices YONGQIANG XUE, WILLIAM KENNERLY, University at Albany-SUNY — Experimental advances in electrically and optically probing individual molecules have provided new insights into the behavior of single quantum objects and their interaction with the nanoenvironments without requiring ensemble average. Single-molecule devices are open quantum systems whose dynamics are intrinsically stochastic and are subject to dissipation and decoherence through system-environment correlation. New concepts and computational techniques may be needed to unravel the rich physics underlying single-molecule measurements. In this talk, we discuss our efforts in developing quantum open systems theory of single-molecule electronics and optics, building on concepts and techniques from quantum optics and quantum measurement.

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