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Joining and Decomposing Reaction Networks

Systems biology focuses on modeling complex biological systems, such as metabolic and cell signaling networks. These biological networks are modeled with polynomial dynamical systems that can be described with directed graphs. Analyzing these systems at steady-state results in polynomial ideals with significant combinatorial structure and whose elements can be used for model selection. Focusing on the problem of finding steady-state invariants of an elimination ideal, we explore the algebra of decomposing a larger reaction network into smaller subnetworks. This talk is based on joint work with Heather Harrington, Nicolette Meshkat, and Anne Shiu.