Efficient noncommutative polynomial optimization by exploiting sparsity

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Many problems arising from quantum information can be modelled as noncommutative polynomial optimization problems. The moment-SOHS hierarchy approximates the optimum of noncommutative polynomial optimization problems by solving a sequence of semidefinite programming relaxations with increasing sizes. In this talk, I will show how to exploit various sparsity patterns encoded in the problem data to improve scalability of the moment-SOHS hierarchy for eigenvalue and trace optimization problems.