Zehua Lai* (laizehua@uchicago.edu). On Matrix Arithmetic-Geometric Mean Inequality and Noncommutative Positivstellensatz.

We discuss the matrix arithmetic-geometric mean (AM-GM) inequality and applications of noncommutative Positivstellensatz. The classical AM-GM inequality dates back to Newton’s era, while people are still unable to prove or disprove a noncommutative version of it. We use the noncommutative Positivstellensatz to establish a partial result on the AM-GM inequality which reveals the critical difference between the classical and noncommutative version. (Received July 15, 2019)