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Lester Mackey* (lmackey@stanford.edu), **Michael I Jordan**, **Richard Y Chen**, **Brendan Farrell** and **Joel A Tropp**. *Stein's Method for Matrix Concentration*.

Motivated by the problem of estimating matrices from a small number of random measurements, I will show how Stein's method of exchangeable pairs can be used to derive concentration inequalities for matrix-valued random elements. When applied to a sum of independent random matrices, this approach yields matrix generalizations of the classical inequalities due to Hoeffding, Bernstein, Khintchine, and Rosenthal. The same technique delivers bounds for sums of dependent random matrices and more general matrix functionals of dependent random elements. (Received September 13, 2014)