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On almost commuting matrices

We prove that, for certain classes of matrices A and B, the following holds: for any $\varepsilon > 0$ there exists $\delta > 0$ so that, if $|||AB - BA|||_p < \delta$, there are commuting matrices A' and B' such that $|||A - A'|||_p + |||B - B'|||_p < \varepsilon$. Here, $||| \cdot |||_p$ is the normalized Schatten p norm, defined via $|||X|||_p = (\sum_i \sigma_i(X)^p/n)^{1/p}$, where $(\sigma_i(X))_{i=1}^n$ are the singular numbers of the $n \times n$ matrix X. This is a joint work with Mustafa Said from UCI.