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**Theorem** [K, Woodruff NeurIPS '23]: Any algorithm using  $n^{2-\beta}$  linear measurements per round must run for  $\Omega(\log n / \log \log n)$  rounds to output  $B$  satisfying

$$\|A - B\| \leq 2\sigma_{k+1}(A)$$

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# Proof Ideas