



Next Steps

- See if similar techniques can be employed to study matrix-vector product lower bounds for



- Current algorithms use  $\mathcal{O}(k/\sqrt{\varepsilon})$  matrix-vector products

- Tight for  $k = 1$  [Bakshi, Narayan '23]

- Extending it to all  $k$ ?

$$\|A - B\|_2 \leq (1 + \varepsilon) \sigma_{k+1}(A)$$



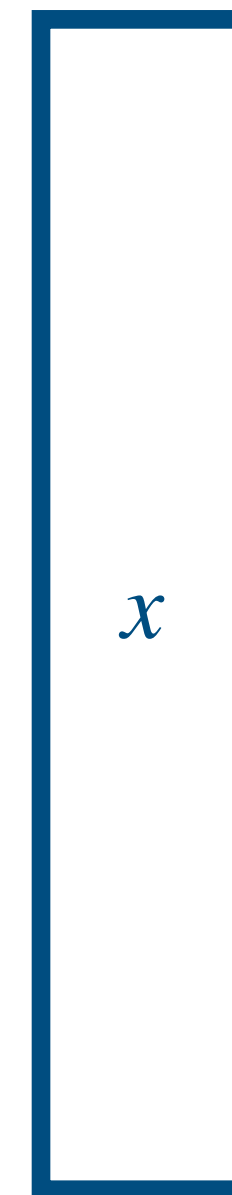
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# Turnstile Streaming



$x$

Updates:  $(i_1, \Delta_1)$   $(i_2, \Delta_2)$   $\dots$   $(i_m, \Delta_m)$