What can a deterministic algorithm do?

- Starts with deterministic matrices $S_1^{(1)}, \ldots S_t^{(1)}$ and obtains

- Based on responses, pick $S_1^{(2)}, \ldots, S_t^{(2)}$ and so on

- Assume $\mathrm{vec}(S_i^{(j)})$ are orthonormal w.l.o.g

- Are first round responses enough to pick good measurements in second round?

$$r_i^{(1)} = \langle \mathrm{vec}(S_i^{(1)}), (\alpha/\sqrt{n}) \cdot u \otimes v \rangle + \langle \mathrm{vec}(S_i^{(1)}), \mathrm{vec}(G) \rangle$$

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Deterministic Algorithm

- Stack $S_1^{(1)}, \ldots, S_t^{(1)}$ to get a matrix $Q^{(1)}$

$$r^{(1)} = \frac{\alpha}{\sqrt{n}} Q^{(1)} \, u \otimes v + Q^{(1)} \, \text{vec}(G)$$

- Based on $r^{(1)}$ pick $Q^{(2)}[r^{(1)}]$