

# Magic States Distillation Using good qLDPC.

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January 1, 2024

Let  $|f\rangle$  be a codeword in  $C_X$ , and let  $X_g$  be the indicator that equals 1 if  $f$  has support on  $X_g$ , and 0 otherwise. Observe that applying  $T^{\otimes}$  on  $|f\rangle$  yields the state:

$$\begin{aligned} T^{\otimes n} |f\rangle &= T^{\otimes n} \left| \sum_g X_g g \right\rangle = \exp i\pi/4 \sum_g X_g |g| - 2 \cdot \pi/4 \sum_{g,h} X_g X_h |g \cdot h| \\ &\quad + 4 \cdot i\pi/4 \sum_{g,h} X_g X_h X_l |g \cdot h \cdot l| - 8 \cdot i\pi/4 \cdot \text{integers} |f\rangle \end{aligned}$$