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Irreducible normalizer operators and thresholds for degenerate quantum codes with sublinear distances[1] LEONID P. PRYADKO, ILYA DUMER, University of California, Riverside, ALEXEY A. KOVALEV, University of Nebraska—Lincoln — We construct a lower (existence) bound for the threshold of scalable quantum computation which is applicable to all stabilizer codes, including degenerate quantum codes with sublinear distance scaling. The threshold is based on enumerating irreducible operators in the normalizer of the code, i.e., those that cannot be decomposed into a product of two such operators with non-overlapping support. For quantum LDPC codes with logarithmic or power-law distances, we get threshold values which are parametrically better than the existing analytical bound [1] based on percolation. The new bound also gives a finite threshold when applied to other families of degenerate quantum codes, e.g., the concatenated codes. [1] A. A. Kovalev and L. P. Pryadko, PRA **87**, 020304(R) (2013).

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