

Supporting Information

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Table S2. Table of RHS values.

| | |
|-------------------|------------|
| T | -8.369E+01 |
| θ_{H_2} | -1.124E-03 |
| θ_{O_2} | -1.784E-02 |
| θ_O | 8.762E-12 |
| θ_{OH} | 0.000E+00 |
| θ_{H_2O} | 0.000E+00 |
| θ_H | 5.618E-04 |
| θ_{HO_2} | 1.840E-02 |
| $\theta_{H_2O_2}$ | 0.000E+00 |
| θ_{Ar} | 0.000E+00 |

Table S3. Table of initial state vector values.

| | |
|-------------------|------|
| T | 1200 |
| θ_{H_2} | 0.05 |
| θ_{O_2} | 0.45 |
| θ_O | 0 |
| θ_{OH} | 0 |
| θ_{H_2O} | 0 |
| θ_H | 0 |
| θ_{HO_2} | 0 |
| $\theta_{H_2O_2}$ | 0 |
| θ_{Ar} | 0.5 |

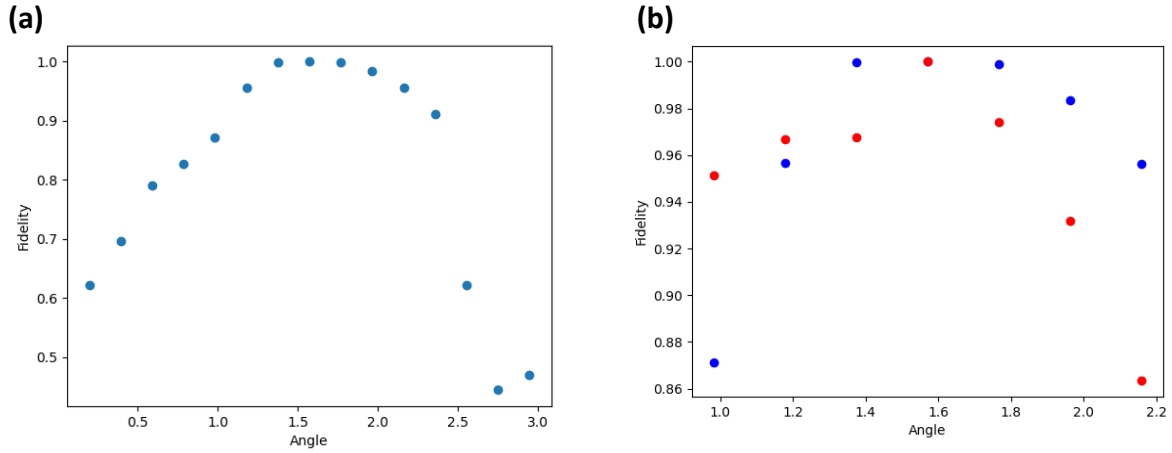
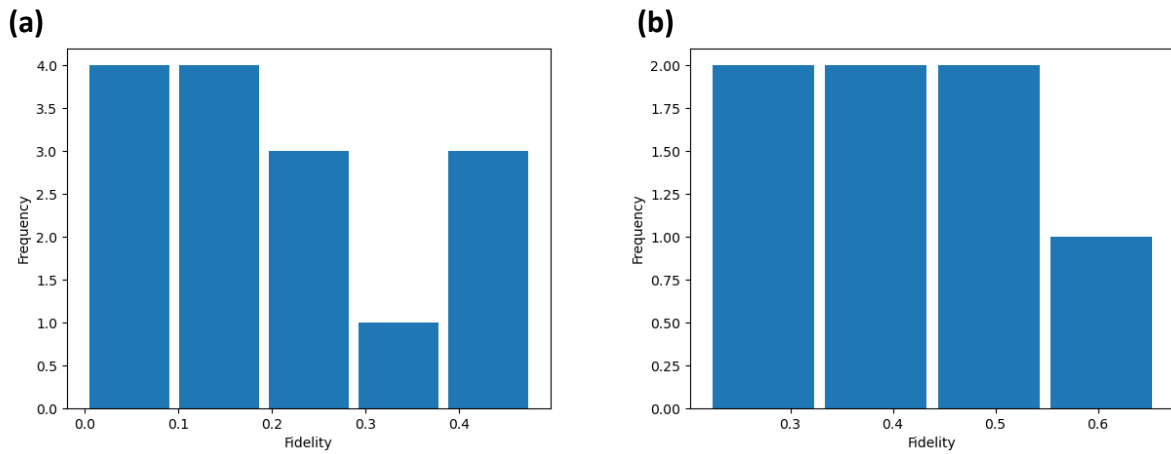


Figure S1. Fidelity of quantum solution based upon angle between vectors in 2×2 matrix A . For the blue points in (b), the first row of each matrix A was the vector $[1 \ 0]$ and the second row of each matrix A was a rotation of this vector by some angle θ (increments of $\frac{\pi}{16}$ radians). For the red points in (b), these rows are permuted. In other words, the first row and the second row are



swapped.

Figure S2. Fidelity of quantum solution with random orthogonal matrices A .

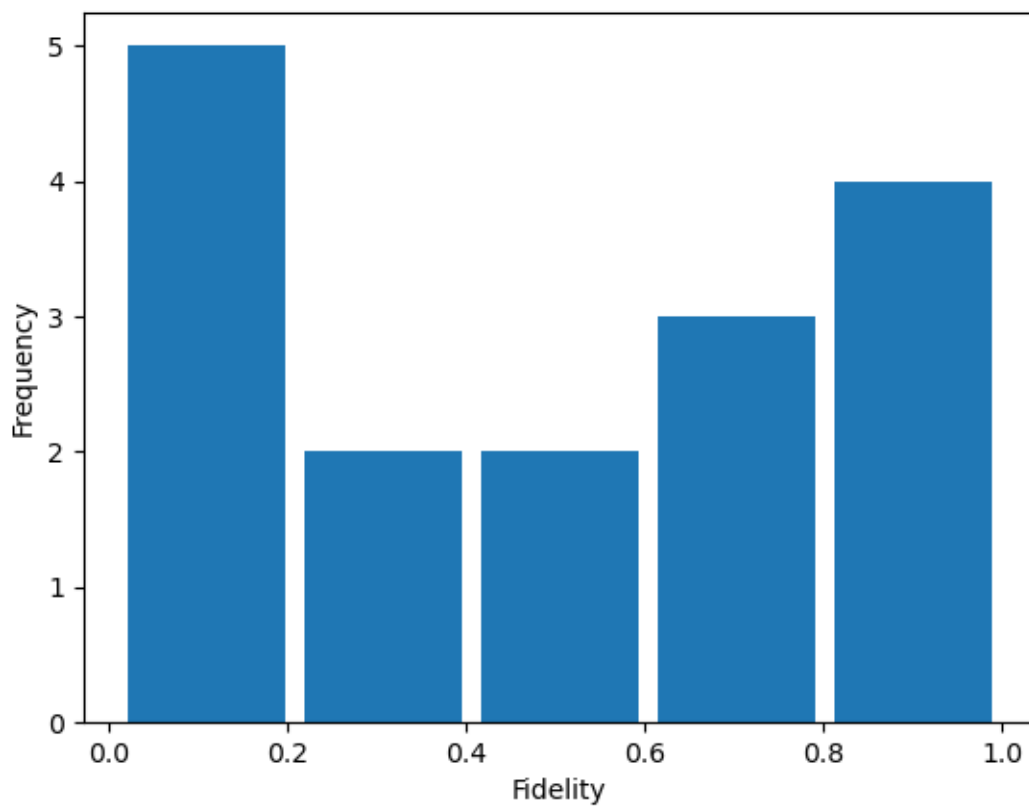


Figure S3. Fidelity of quantum solution to linear systems of equations ($Ax = b$) with random orthonormal matrices A .

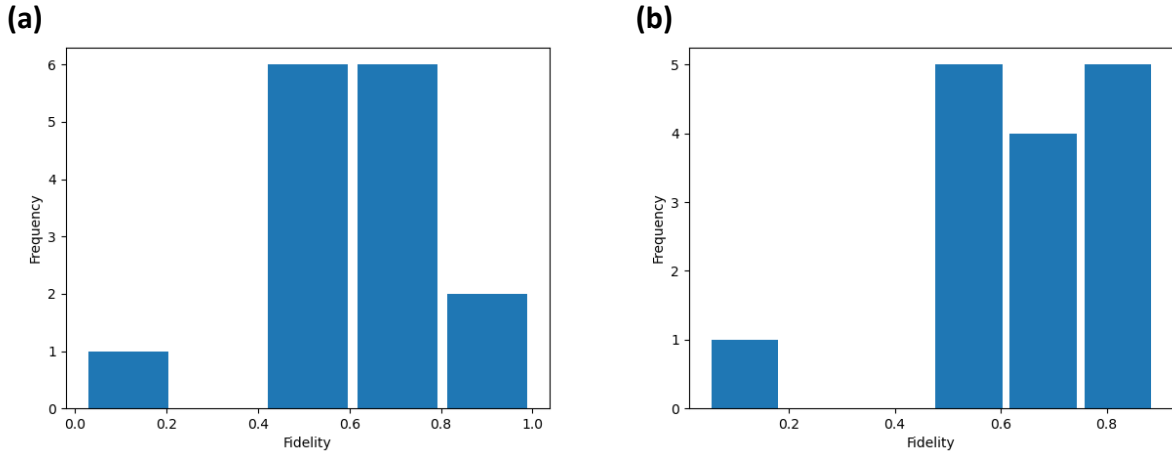
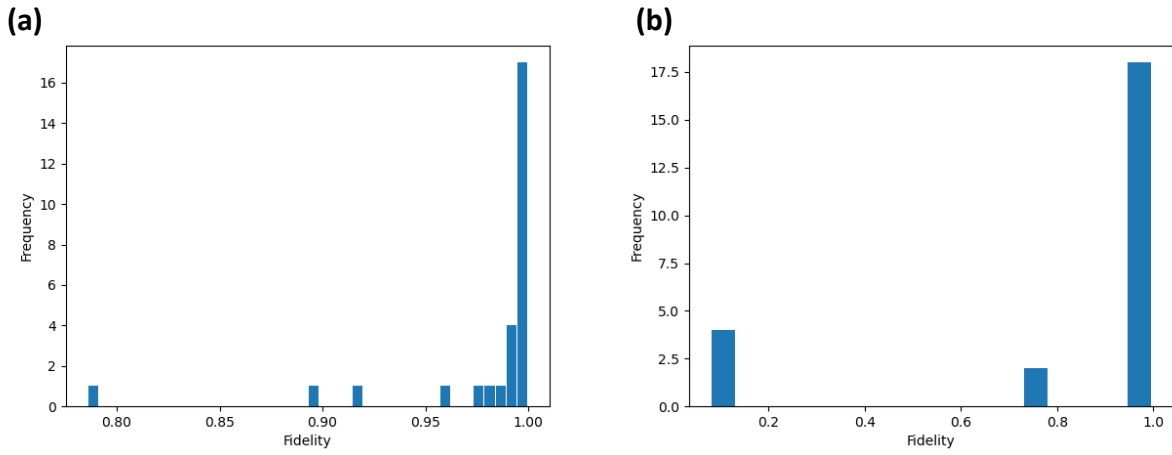


Figure S4. Fidelity of quantum solution to linear systems of equations ($Ax = b$) with random



diagonal matrices A .

Figure S5. Fidelity of quantum solution to linear systems of equations ($Ax = b$) with random matrices A and select vectors $b = \lambda v$ (for some eigenvalue λ and eigenvector v pair of A).

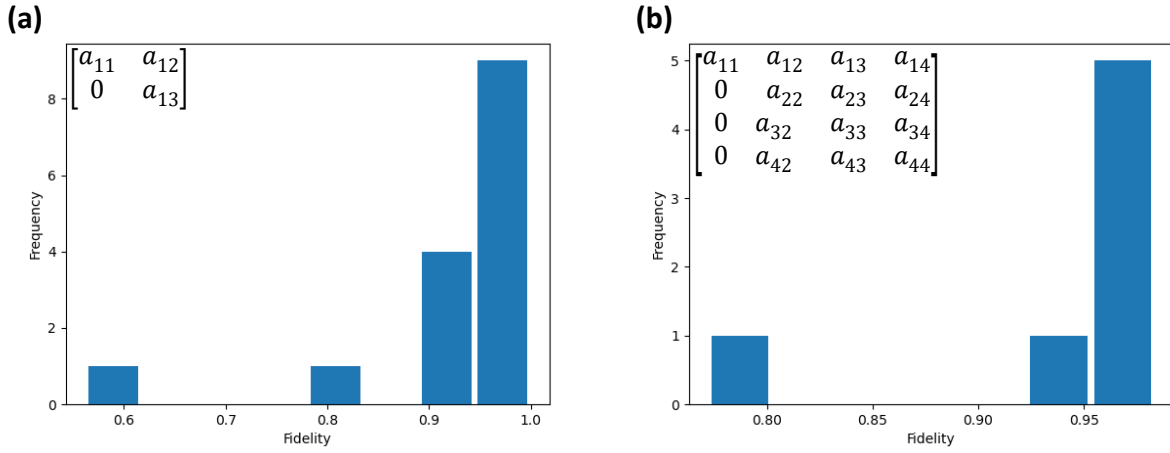


Figure S6. Fidelity of quantum solution to linear systems of equations ($Ax = b$) with random matrices A of the forms shown above. (a) Two-dimensional. (b) Four-dimensional.