

Abstract Submitted  
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**Minimal Proofs of the Kochen-Specker theorem within the N-qubit Pauli group** MORDECAI WAEGELL, P.K. ARAVIND, Worcester Polytechnic Institute — A complete class of minimal KS proofs is given for a system of N qubits. There exists a class of KS proofs using the observables of the N-qubit Pauli group, which make no direct use of rays. One particular family of these proofs, which we call “Kites,” is given for all N, with the N=2 case being the familiar Peres-Mermin Square. Each Kite generates a set of rays and bases which also prove the KS theorem. By discarding some of these rays and bases we obtain minimal KS proofs in Hilbert Spaces of all dimensions  $2^N$ . These proofs involve different numbers of projectors, but always contain just 9 measurement bases (or contexts), with Cabello’s 18-9 proof for N=2.

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