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Chaobin Liu* (cliu@bowiestate.edu), Department of Mathematics, Bowie State University, 14000 Jericho Park Road, Bowie, MD 20715. *On the standard deviation of position distribution for a quantum walk on the line.*

Consider the quantum random walk on the line determined by a 2×2 unitary matrix $U(k)$. In terms of $U(k)$, we derive explicit expressions for the first two moments of the position probability distribution. We show how the standard deviation $\sigma(t)$ of this distribution is determined by the eigenvalues of $U(k)$. This approach simplifies and clarifies certain prior derivations based on Fourier transform methods. Starting in the classical state $|0\rangle \otimes |1\rangle$, we infer that the maximum leading term of $\sigma(t)$ is $\frac{t}{2}$. (Received September 13, 2007)