1024-81-260 **Alexei Ashikhmin*** (`aea@alcatel-lucent`), 600 Mountain Ave., 2C-355, Murray Hill, NJ 07974. *Fidelity of Quantum Coded Measurement.*

A quantum code Q is a k-dimensional subspace of complex space $\mathbf{C}^n$. Let a random quantum state (vector) $\mathbf{v}$ of Q is corrupted by the quantum depolarizing channel with error crossover probability p. The corrupted state is $\mathbf{w} = E\mathbf{v}$, where E is an error operator. One possible strategy for denoising $\mathbf{w}$ is to make the von Neumann measurement of $\mathbf{w}$ with respect to Q and to $Q^{\perp}$. If the result of the measurement, say $\mathbf{z}$, belongs to Q we assume that the original state $\mathbf{v}$ is reconstructed, though typically $\mathbf{z}$ dose not equal to $\mathbf{v}$. An important question is how typically $\mathbf{z}$ is far away from $\mathbf{v}$. As the measure of the closeness between $\mathbf{z}$ and $\mathbf{v}$ the quantity $F = |\langle \mathbf{z}, \mathbf{v} \rangle|^2$, called the fidelity, is used.

In this work we estimate the expectation of the fidelity under the condition that $\mathbf{z} \in Q$. First, we derive an exact expression for the fidelity in terms of the quantum weight enumerators of the code Q. Next, we show that in asymptotics, as the code length tends to infinity, the fidelity exhibits a threshold behavior — it tends either to 1 or to 0 depending on the size of Q and the channel error probability p. (Received January 10, 2007)