Twirl: Equating Quantum and Thermodynamic Entropy Productions

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We search for a "graceful" non-unitary map G whose von Neumann entropy gain coincides with the calculated thermodynamic entropy production. Our candidate for G is the so-called "twirl" introduced to quantum information theory by Bennett, also used in the theory of quantum reference frames. Relevance of frame averaging (twirling) for real world irreversibility is outlined.