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Local Discrimination with One-way Communication of Bipartite Orthogonal Quantum States ALVIN GONZALES, Southern IL Univ-Carbondale Computer Science Master Student, ERIC CHITAMBAR, Southern IL Univ-Carbondale Physics Department — Quantum state discrimination is a fundamental problem in quantum communication. We investigate the optimal distinguishability of orthogonal bipartite quantum states. The scenario consists of three parties: Alice, Bob, and Charlie. Charlie prepares one of two orthogonal states and sends one qubit to Alice and the other to Bob. Their goal is to correctly identify which state Charlie sends. In most state discrimination scenarios it is assumed that Alice and Bob can freely communicate with one another. In this talk, we consider a more restricted setting where only one-way communication is allowed. Consequently, Alice and Bob might differ in guessing which state Charlie distributes. When the communication is from Alice to Bob, there are two figures of merit: (i) Alice's greatest probability of identifying the state, and (ii) Bob's greatest probability of identifying the state when assisted by Alice's communication. The question we consider is whether both of these optimal probabilities can be simultaneously obtained. We show that in general they cannot. In other words, sometimes Alice must sacrifice knowledge to optimize Bob's chances of distinguishing the states. In the worst case scenario, Alice's ability to distinguish correctly shrinks from 100% to 50%.

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