1077-94-1628 **Vitaly Skachek*** (vitaly.skachek@gmail.com), Coordinated Science Lab, University of Illinois at Urbana-Champaign, 1308 W. Main St., Urbana, IL 61801, and **Olgica Milenkovic** and **Angelia Nedic**. *Hybrid Noncoherent Network Coding.*

We describe a novel extension of subspace codes for noncoherent networks, suitable for use when the network is viewed as a communication system that introduces both dimension and symbol errors. We show that when symbol erasures occur in a significantly large number of different basis vectors transmitted through the network and when the min-cut of the networks is much smaller then the length of the transmitted codewords, the new family of codes outperforms their subspace code counterparts.

For the proposed coding scheme, termed hybrid network coding, we derive two upper bounds on the size of the codes. These bounds represent a variation of the Singleton and of the sphere-packing bound. We show that a simple concatenated scheme that represents a combination of subspace codes and Reed-Solomon codes is asymptotically optimal with respect to the Singleton bound. Finally, we describe two efficient decoding algorithms for concatenated subspace codes that in certain cases have smaller complexity than their subspace decoder counterparts. (Received September 20, 2011)