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**Katherine B Morrison\*** (s-kmorri11@math.unl.edu), Department of Mathematics, 203 Avery Hall, University of Nebraska, Lincoln, NE 68588. *Towards a Duality Theory of Subspace Codes for Network Coding.*

Subspace codes were first proposed for use in error correction for random network coding by Koetter and Kschischang in 2008. One common construction for subspace codes is the lifting of linear codes whose codewords are either matrices over  $\mathbb{F}_q$  or vectors over  $\mathbb{F}_{q^m}$  with the rank metric; both space-time codes and rank-metric codes have been utilized to create efficient subspace codes. Grant and Varanasi proved a functional MacWilliams Identity for space-time codes, and Gadouleau and Yan proved a functional MacWilliams Identity for rank-metric codes. Yet, despite the fact that rank-metric codes can give rise to space-time codes, these MacWilliams Identities do not agree, as they are derived for different notions of dual. This talk aims to examine which notion of dual is more applicable to subspace codes and aims to use this to generate a duality theory for more general constructions of subspace codes as well. (Received January 26, 2010)