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Paige G. Beidelman* (pbeidelm@mail.umw.edu) and **Kimberly Nicole Hancock** (khancock@bowdoin.edu), 16 Deerfield Road, Brookfield, CT 06804, and **Kaiwen Lu** (kailu@umich.edu) and **Pedro D Morales Vega** (pedromv9616@gmail.com), 903 Lamberton DR, Silver Spring, MD 20902, and **Nathan J Akerhielm** (nakerhielm@haverford.edu), 540 Crescent Avenue, Greenville, SC 29601. *Solvability of Multiple Unicast Networks Over Finite Fields.*

At Clemson University, we researched communication across interference networks called multiple unicast networks. Our goal was to determine the achievable capacity of some classes of networks when one is only using linear operations. After an introduction to the problem, we translated the problem in commutative algebra language by showing that achievability corresponded to the existence of a solution of an ideal defined by the network. We then showed that some transformations on the adjacency matrix of networks preserved achievability allowing us to work with a smaller class of representative networks. Finally we discovered a lower bound of messages that can be sent from one source to its corresponding terminal given the entire network in reduced form. This project was a joint work with Felice Manganiello and Kristen Savary. (Received September 17, 2019)