1106-14-1104 **Sarah E Anderson*** (sarah5@g.clemson.edu). *Applications of algebraic geometry to polar coding.*

In recent groundbreaking work, Arikan developed polar codes as an explicit construction of symmetric capacity achieving codes for binary discrete memoryless channels with low encoding and decoding complexities. A specific 2×2 binary kernel matrix G is considered, and $G^{\otimes n}$ is used to create 2^n new channels. As the number of channels grows, each channel becomes either a noiseless channel or a pure-noise channel, and the rate of this polarization is related to the kernel matrix used. Since Arikan's original construction, polar codes have been generalized to q-ary discrete memoryless channels, where q is a power of a prime, and other matrices have been considered as kernels. In our work, we expand on the ideas of Mori and Tanaka and Korada and Şaşoğlu by employing algebraic geometric codes to produce kernels of polar codes, specifically codes from maximal and optimal function fields. (Received September 16, 2014)