1106-94-2908 **Igor Zelenko***, zelenko@math.tamu.edu, **Muxi Yan**, mxyan@tamu.edu, **Alex Sprintson**, spalex@tamu.edu, and **Swanand Kadhe**, kswanand1@tamu.edu. *On MDS Codes with Constrained Generator Matrices and Related Problems.*

Our aim is to design generator matrices of Maximum Distance Separable (MDS) codes such that each row of the generator matrix has a specific support. More specifically, we consider an (n, k)-MDS code for which each row of its generator matrix contains up to $k-1$ zeros at certain places, and the elements at the remaining places can be assigned any values from the underlying finite field. We call such a generator matrix as the constrained generator matrix G_{con}. It can be shown that if G_{con} does not contain an $l \times m$ zero sub-matrix such that $l + m = k + 1$, then randomly choosing the values of non-zero elements over a finite field of sufficiently large size results in an MDS code with high probability. We say that G_{con} is feasible if it is possible to complete it to an MDS code. We conjecture that it is possible to linearly transform a Vandermonde matrix to obtain the constrained generator matrix with high probability for any feasible matrix G_{con}. We verify this conjecture for a large number of cases. This conjecture admits a number of reformulations that lead to interesting conjectures in algebraic geometry, abstract algebra and number theory. In particular, our method to verify it is based on a purely geometric reformulation of the problem. (Received September 17, 2014)