1102-05-113 **Gergely T. Balint** and **Robert B. Ellis*** (rellis@math.iit.edu), Applied Mathematics, 10 W 32nd St, E1 Rm 208, Chicago, IL 60637. *Group testing matrices via latin hypercube-based MDS codes.* Preliminary report.

The point of group testing, or pooling, is to reduce the cost of finding defective items in a population by testing pools of items rather than each individually. A binary group testing matrix has rows indexed by tests and columns by items, with a 1 indicating an item is included in the pool for the corresponding test. The defective items are identified from the binary test results, each of which is positive exactly when the corresponding pool contains a defective item. Group testing matrices can be obtained from Steiner systems, constant-weight codes, and superimposed codes, for example.

We introduce a new "Latin Square" construction for producing new group testing matrices from old, which amounts to code concatenation with an outer maximum distance separable (MDS) code over $\mathbb{Z}_n$, and an inner code consisting of the columns of the base matrix. We also discuss two ways of improving the resulting matrix, one more coding-theoretic and one more graph-theoretic. Several best-known matrices for real-world parameters result.

This is joint work with Gergely Bálint. (Received July 25, 2014)