1077-H1-844 **Nate L. Coursey*** (ncoursey@students.kennesaw.edu). *Mutually Orthogonal Sudoku Latin Squares.* Preliminary report.

A Latin square of order n is an $n \times n$ matrix where each row and column is a permutation of the integers $1, 2, ..., n$. Two Latin squares A and B, both of order n, are orthogonal if all n^2 ordered pairs formed by juxtaposing the two matrices are unique. It is well known that there exists a pair of orthogonal Latin squares of order n for every positive integer $n \neq 2, 6$. A family of mutually orthogonal Latin squares (MOLS) of order n is a collection of Latin squares of order n such that each Latin square in the collection is orthogonal to every other Latin square in the collection. It is relatively easy to show that the maximum size of a collection of MOLS of order n is $n - 1$.

A gerechte design is a an $n \times n$ matrix where the matrix is partitioned in n regions $S_1, S_2, ..., S_n$ where each row, column and region is a permutation of the integers $1, 2, ..., n$. The popular puzzle Sudoku is an example of a gerechte design.

Results about mutually orthogonal Sudoku Latin squares of order $n = k^2$ are beginning to appear in journals. This talk discusses the adjustments that must be made when n is not a perfect square and the size of critical sets (clues) of mutually orthogonal Sudoku Latin squares. (Received September 13, 2011)