1138-46-97 **Remus Nicoara*** (`rnicoara@utk.edu`), 405 Circle Drive, University of Tennessee, Knoxville, TN 37966. *Analytic deformations of group commuting squares.*

Let G be a finite group and denote by $\mathfrak{C}_G$ the commuting square associated to G. The defect of the group G, given by the formula $d(G) = \sum_{g\in G} \frac{|G|}{order(g)}$, gives an upper bound for the number of linearly independent directions in which $\mathfrak{C}_G$ can be continuously deformed in the class of commuting squares. We show that this bound is actually attained, by constructing $d(G)$ analytic families of commuting squares containing $\mathfrak{C}_G$.

In the case $G = \mathbb{Z}_n$, the defect $d(\mathbb{Z}_n)$ can be interpreted as the dimension of the enveloping tangent space of the real algebraic manifold of $n \times n$ complex Hadamard matrices, at the Fourier matrix F_n. The dimension of the enveloping tangent space gives a natural upper bound on the number of continuous deformations of F_n by complex Hadamard matrices, of linearly independent directions of convergence. Our result shows that this bound is reached, which is rather surprising. In particular our construction yields new analytic families of complex Hadamard matrices stemming from F_n. (Received February 03, 2018)