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Tuyen Trung Truong* (truongt@indiana.edu), Tuyen Trung Truong, Department of mathematics, Indiana University, Bloomington, IN 47405. *Degree growth of birational maps related to matrix inversions.*

For $q \geq 3$, let \mathcal{M}_q denote the space of $q \times q$ matrices with coefficients in \mathbb{C} , and let $\mathbb{P}(\mathcal{M}_q)$ denote its projectivization. For a matrix $x = (x_{ij})_{1 \leq i, j \leq q}$, we consider two maps. One is the Hadamard inverse $J(x) = (x_{ij}^{-1})$ which takes the reciprocal of each entry of the matrix, and the other is the matrix inverse $I(x) = (x_{ij})^{-1}$. Define $K = I \circ J$. This map was introduced by some mathematical physicists to study some problems in statistical mechanics.

In this talk, I will show that the degree complexity $\delta(K)$ of K is equal to the largest modulus of the roots of the polynomial $\lambda^2 - (q^2 - 4q + 2)\lambda + 1$ (this is joint work with Professor Eric Bedford.). Time allowed, I will show that this number is also the degree complexity of the restriction of the map K to the space of symmetric matrices. These results were conjectured by Angles d'Auriac, Maillard and Viallet. (Received September 07, 2010)