1117-14-216   **Huajun Huang** and **Luke Oeding*** (`oeding@auburn.edu`), Department of Mathematics and Statistics, 221 Parker Hall, Auburn, AL 36849. *Symmetrization of Principal Minors and Cycle Sums.*

We solve the Symmetrized Principal Minor Assignment Problem, that is we show how to determine if for a given vector $v \in \mathbb{C}^n$ there is an $n \times n$ matrix that has all $i \times i$ principal minors equal to v_i. We use a special isomorphism (a non-linear change of coordinates to cycle-sums) that simplifies computation and reveals hidden structure. We use the symmetries that preserve symmetrized principal minors and cycle-sums to treat 3 cases: symmetric, skew-symmetric and general square matrices. We describe the matrices that have such symmetrized symmetrized principal minors as well as the ideal of relations among symmetrized principal minors / cycle-sums. We also connect the resulting algebraic varieties of symmetrized principal minors to tangential and secant varieties, and Eulerian polynomials. (Received January 14, 2016)

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