Ariel Barton* (aeb019@uark.edu), Steve Hofmann and Svitlana Mayboroda. The Neumann problem for symmetric higher order elliptic differential equations.

Second order equations of the form $\nabla \cdot A \nabla u = 0$, with $A$ a uniformly elliptic matrix, have many applications and have been studied extensively. A well known foundational result of the theory is that, if the coefficients $A$ are real-valued, symmetric, and constant along the vertical coordinate (and merely bounded measurable in the horizontal coordinates), then the Dirichlet problem with boundary data in $L^2$ or $W^1_1$ and the Neumann problem with boundary data in $L^2$ are well-posed in the upper half-space.

The theory of higher order elliptic equations of the form $\nabla^m \cdot A \nabla^m u = 0$ is far less well understood. In this talk we will generalize well posedness of the $L^2$ Neumann problem in the half-space to the case of higher-order equations with real symmetric vertically constant coefficients. (Received January 23, 2018)