1026-42-132 **Elena Ournycheva***, ournyche@math.kent.edu, and **Boris Rubin**. *Semyanistyi's integrals and Radon transforms on matrix spaces.*

We introduce a new analytic family of intertwining operators which include the Radon transform over matrix planes and its inverse. These operators generalize integral transformations introduced by Semyanistyi in his research related to the hyperplane Radon transform in R^n. We obtain an extended version of Fuglede's formula, connecting generalized Semyanistyi's integrals, Radon transforms and Riesz potentials on the space of real rectangular matrices. This result combined with the matrix analog of the Hilbert transform leads to variety of explicit inversion formulas for the Radon transform of functions of matrix argument. (Received February 22, 2007)