

**Meeting:** 1003, Atlanta, Georgia, SS 5A, AMS Special Session on Radon Transform and Inverse Problems, I

1003-42-1037      **Gestur Olafsson** and **Elena Ournycheva\*** (ournyce@math.huji.ac.il), Institute of Mathematics, The Hebrew University of Jerusalem, 91904 Jerusalem, Israel, and **Boris Rubin**.  
*Multiscale wavelet transforms, ridgelet transforms, and Radon transforms on the space of matrices.*

Let  $M$  be the space of real  $n \times m$  matrices which can be identified with the euclidean space  $R^{nm}$ . We introduce continuous wavelet transforms on  $M$  with a multivalued scaling parameter represented by a positive definite symmetric matrix. The new transforms agree with the polar decomposition on  $M$  and coincide with classical ones in the rank-one case  $m = 1$ . We prove an analog of Calderón's reproducing formula for  $L^2$ -functions of matrix argument and obtain explicit inversion formulas for the corresponding Riesz potentials and Radon transforms. We also introduce continuous ridgelet transforms associated to matrix planes in  $M$ . An inversion formula for these transforms follows from that for the Radon transform. (Received October 03, 2004)