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**Fulton B. Gonzalez\*** ([fulton.gonzalez@tufts.edu](mailto:fulton.gonzalez@tufts.edu)), Department of Mathematics, Tufts University, Medford, MA 02155. *Invariant Differential Operators on Matrix Motion Groups and Applications to the Matrix Radon Transform.*

Let  $M_{n,k}$  denote the vector space of real  $n \times k$  matrices. The matrix motion group is the semidirect product  $(O(n) \times O(k)) \ltimes M_{n,k}$ . The matrix Radon transform is an integral transform associated with a double fibration involving homogeneous spaces of this group. In this talk, we provide a set of algebraically independent generators of the subalgebra of its universal enveloping algebra invariant under the Adjoint representation. One of the elements of this set characterizes the range of the matrix Radon transform, and another gives rise to the Cayley-Laplace operator which is used in its inversion. (Received January 23, 2008)