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**Gestur Olafsson\*** (olafsson@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803, and **Angela Pasquale**. *The  $\cos^\lambda$ -transform and intertwining operators for  $SL(n, \mathbb{F})$ .*

The  $\cos^\lambda$ -transform and the related  $\sin^\lambda$ -transform have been widely studied the last few years because their role in harmonic analysis and convex geometry. What is less known is their connection to representation theory and intertwining operators. In this talk we connect topics from convex and integral geometry with well known topics in representation theory of semisimple Lie groups by showing that the  $\cos^\lambda$  and  $\sin^\lambda$ -transforms on Grassmann manifolds are standard intertwining operators between certain generalized principal series representations induced from a maximal parabolic subgroup of  $SL(n+1, \mathbb{F})$ . The general results of Knapp and Stein and Vogan and Wallach then show that both transforms have meromorphic extension to  $\mathbb{C}$  and are invertible for generic  $\lambda$ . Furthermore, known methods from representation theory combined with a Selberg type integral allow us to determine the  $K$ -spectrum of those operators. (Received September 16, 2011)