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**Brian Hall** (bhall@nd.edu), 134 Hayes-Healy Hall, Notre Dame, IN 46556. *The Free Unitary  
Segal-Bargmann-Hall Transform.*

The Segal-Bargmann transform is unitary map from the  $L^2$  space of Gaussian measure to the *holomorphic*  $L^2$  space of (a dilated) Gaussian measure, that intertwines the Schrödinger and Heisenberg pictures in quantum mechanics. Hall later generalized it, in the context of geometric quantization, to compact Lie groups: the Segal-Bargmann-Hall transform maps the  $L^2$  space of the heat kernel measure on the group  $G$  to the holomorphic  $L^2$  space of the complexified group  $G_{\mathbb{C}}$  with its (dilated) heat-kernel measure.

Taking  $G = U(n, \mathbb{C})$  the  $n \times n$  unitary group, and boosting the transform to be matrix valued, Biane studied the action on functional calculus, and developed a free Segal-Bargmann-Hall transform using free Malliavin calculus; however, his construction does not make direct contact with the finite-dimensional transform. Here, we will discuss an extension of this picture to a larger class of functions (dense in the equivariant functions on  $U(n, \mathbb{C})$ ) that identifies Biane's transform as the limit as  $n \rightarrow \infty$  of the Segal-Bargmann-Hall transform on  $U(n, \mathbb{C})$ . (Received September 22, 2012)