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**Gelu Popescu\*** ([gelu.popescu@utsa.edu](mailto:gelu.popescu@utsa.edu)), Department of Mathematics, University of Texas,  
San Antonio, TX 78249. *Free holomorphic functions on the unit ball of  $B(H)^n$ .*

We develop a theory of holomorphic functions in several noncommuting (free) variables and provide a framework for the study of tuples of bounded linear operators on Hilbert spaces. We introduce a free analytic functional calculus and study it in connection with Hausdorff derivations, noncommutative Cauchy and Poisson transforms, and von Neumann type inequalities. Several classical results from complex analysis have free analogues in our noncommutative multivariable setting. (Received August 07, 2006)