1144-62-202 **Tao He*** (hetao@sfsu.edu), 1600 Holloway Ave, San Francisco State University, San Francisco, CA 94132, and **Yuehua Cui**, **Ping-Shou Zhong** and **V. Mandrekar**. *Testing High-dimensional Non-parametric Functions with Applications in SNP/Gene Set Analysis.*

High-dimensional data arise in a wide range of areas, such as biology, imaging and climate. A common feature of high-dimensional data is that the number of features could be much larger than the sample size, the so-called "large p, small n" problem. This study is motivated by a specific example in genomic studies when the question of interest is to detect SNP sets or gene sets that are associated with certain trait. To model the systematic mechanism and potential complex interactions among genetic variants, we consider a flexible nonparametric function in a reproducing kernel Hilbert space. We propose a test statistic and study its asymptotic distributions under the null hypothesis and a series of local alternative hypotheses, under the "large p, small n" setting. We demonstrate our methods through extensive simulation studies and apply to a real data analysis. (Received August 25, 2018)