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Jiashun Jin* (jinj@stat.purdue.edu), 150 N. University St., West Lafayette, IN 47906, and **David Donoho, Tony Cai** and **Mark Low**. *Inference on the Proportion of Nonzero Normal Means*.

Consider a large number of normal random variables $X_j = \mu_j + z_j$, where z_j are iid standard Gaussian. Suppose all but a small proportion of the unknown parameters μ_j are zero. We are interested in the setting where (a). the proportion is very small in the sense that it tends to 0 faster than that of $1/\sqrt{n}$ as n tends to ∞ , and (b). each nonzero μ_j are only moderately large in the sense that its corresponding observation X_j is not large enough to stand out.

Motivated by application examples in speckle astronomy, covert communication, and Taiwan-America Occultation Survey (TAOS), we are interested in (a). testing whether the proportion is zero or nonzero, and (b). estimating the proportion. To address these problems, non-traditional methods are needed as the proportion is very small.

In this talk, we introduce three recent inference tools for the proportion: Higher Criticism, Meinshausen and Rice's confidence lower bound for the proportion, and Cai–Jin–Low confidence lower bound for the proportion . We will discuss the asymptotic behavior of these tools, and compare their strengths and weaknesses. (Received June 01, 2007)