Robust identification in large scale network

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Abstract. A class of distribution free multiple tests is proposed for the identification of network structures in random variables networks. The tests are based on estimations of probability of sign coincidence of pairs of random variables. The quality of the tests is measured by conditional risk with additive loss function. It is proved that in this case multiple tests for threshold graph identification are distribution free in the class of elliptically contoured distributions. It is demonstrated in simulations that this class of tests is distribution free for identification of other important network structures as well. Some applications to market network analysis are discussed.