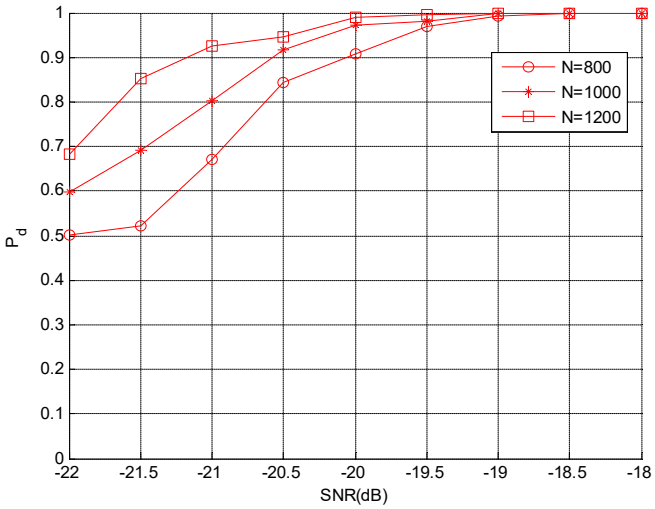

Fig. 11. P_d vs. SNR at P_f = 5% for LEM with different N

V. Conclusions

In this paper, a cooperative spectrum sensing algorithm using leading eigenvector matching is introduced. While PU's signal does not exist, the leading eigenvector is random. But when the signal is present, the leading eigenvector is stable. Due to its robustness, the feature can be learned blindly by FLA and LEM detector uses the feature as prior knowledge. The correlation coefficient between feature learned and the leading eigenvector of sample covariance matrix serves as the test statistic for signal detection. The closed-form expression of the threshold is also derived in this paper. Simulation results show that the algorithm proposed is reasonable and LEM detector outperforms MME detector. It also do not suffer from a noise power uncertainty problem. Compared with MME detector, LEM detector is more robust against the decrease of correlation among the sensing nodes. However there are some inherent flaws in this approach. A feature can only be learned in the presence of the desired PU signal, it cannot be learned in the presence of noise or in the presence of any other signal.

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