A ROBUST MAXIMUM LIKELIHOOD MULTIUSER DETECTOR IN THE PRESENCE OF SIGNATURE UNCERTAINTIES (TueAmPO2)

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**Abstract:** We consider the problem of designing a multiuser detector for synchronous code-division multiple-access (CDMA) systems, where the signature matrix is subject to structured uncertainties. We seek the robust multiuser detector that minimizes the worst-case bit error probability (BER) over all possible values of the unknown signature matrix. We first develop the exact robust multiuser detector. Then, based on the framework of robust semidefinite programming (SDP), we suggest an approximation to the robust multiuser detector that can be obtained as a solution to an SDP, which can be solved efficiently using standard software packages. We then demonstrate through an example that by taking the structure of the uncertainty into account we can increase the detector performance over standard detection methods that do not consider the signature uncertainty.