MACRO- AND MICRO-DIVERSITY IN W-CDMA SYSTEM EMPLOYING SMART ANTENNAS

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ABSTRACT

THIS THESIS AIMS TO PROVIDE A ROBUST MULTIUSER DETECTION STRUCTURE THAT ADAPTIVELY TRACK -S SIGNATURE WAVEFORM DISTORTION FOR FADED CDMA SIGNALS. WE FIRST SYSTEMATICALLY SURVEY VA -RIOUS LINEAR MULTIUSER DETECTORS (LMDS) AND EXPLORE THEIR CONNECTIONS IN THE AWGN CHANNEL IN PRACTICAL WIRELESS ENVIRONMENT, MULTIPATH FADING LEADS TO SIGNATURE WAVEFORM DISTORTION. THAT SEVERELY DEGRADES THE PERFORMANCE OF THE LMDS DESIGNED BY EXPLOITING THE ORIGINAL SIG -NATURE WAVEFORM.THE IMPACT OF SIGNATURE WAVEFORM PERTURBATION ON THE PERFORMANCE OF THE LMDS IS EXTENSIVELY ANALYZED IN THIS PAPER.IN WHAT FOLLOWS,AN ITERATIVE ALGORITHM IS PROPO -SED TO TRACK THE SIGNATURE WAVEFORM PERTURBATION SUCH THAT THE DETECTOR CAN BE DESIGNED BY EXPLOITING THE ESTIMATED EFFECTIVE SIGNATURE WAVEFORM.THE RATIONALE OF ADAPTIVE PROCESSING IS BASED ON THE SUBSPACE METHOD AND THE MINIMUM VARIANCE DISTORTIONLESS RESPONSE (MVDR) BE -AMFORMING TECHNIQUE.PERFORMANCE EVALUATION REVEALS THAT UNDER HOMOGENEOUS FADING ENVIRONMENT ,THE PROPOSED ADAPTIVE MULTIUSER DETECTION STRUCTURE REDUCES THE IMPACT OF SIGNATURE WAVEF -ORM PERTURBATION ON THE PERFORMANCE OF THE LMDS TO A GREAT EXTENT.MOREOVER,THE PROPOSED ITERATIVE ALGORITHM IS NEAR-FAR RESISTANT SINCE BOTH THE SUBSPACE METHOD AND THE MVDR BEAM -FORMING TECHNIQUE ARE ENERGY INDEPENDENT TO THE INTERFERERS.

Keywords : SIGNATURE WAVEFORM, CDMA, SUBSPACE METHOD, MINIMUM VARIANCE DISTORTIONLESS RESPONSE (MVDR) BEAMFORMING

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