

<https://ieeexplore.ieee.org/document/6003383>

Performance assessment and EXIT chart analysis of IDMA-based underwater communications

[S. Aliesawi](#); [C. C. Tsimenidis](#); [B. S. Sharif](#); [M. Johnston](#)

Abstract:

Multi-user spread-spectrum techniques are increasingly being considered for communications in underwater acoustic channels, which vary from stationary with sparse arrivals to rapidly varying channels. Downlink adaptive multiuser architectures, direct form interference cancellation IC-IDMA and separate channel estimation (CE) based Rake IDMA receivers are investigated and applied to simulated data and data obtained from realistic underwater communication trials. These receivers employ continuous pilots that incur energy loss without expanding bandwidth, which is particularly interesting in very fluctuating mediums. The adaptive process operate in just a tracking mode after the initial delay acquisition is accomplished. Both receivers are optimized differently to minimize the metric measurement. The experimental results of three active users, demonstrate the penalty in performance as the fading induces irreducible error rates that increase with channel delay spread and emphasize the benefits of using coherent direct adaptive receivers in such reverberant channels. Moreover, the convergence behaviour of the detectors is evaluated using the EXIT chart analyses and issues such as the adaptation parameters and their effects on the performance are also investigated.

Published in: [OCEANS 2011 IEEE - Spain](#)

Date of Conference: 6-9 June 2011

Date Added to IEEE *Xplore*: 30 August 2011

ISBN Information:

INSPEC Accession Number: 12207332

DOI: [10.1109/Oceans-Spain.2011.6003383](https://doi.org/10.1109/Oceans-Spain.2011.6003383)

Publisher: IEEE

Conference Location: Santander, Spain

Keywords

Receivers, Detectors, Interference, Decoding, Channel estimation, Trajectory,
Fading