

Time Frequency Coding in Underwater Acoustic Communication

Yu Wang

Northwestern Poly-technical University, China

jiaoyg2000@yahoo.com 63216788

Abstract: Due to the difficulties encountered in underwater acoustic communication channels, the most prominent of which is considered to be the multipath propagation. This paper proposes to use the Time-Frequency coding for underwater acoustic communication system in which there is serious multipath interference of transmitted signal.

This paper is divided into three parts. The first part gives a brief overview of characteristics of UWA communication channels and presents communication channel modeling, which uses ray tracing for determining the multipath structure. The second part is devoted to communication system design, which uses different frequency sequence over different time slot being well known as two-dimensional coding. Finally, the third part summarizes the conclusions. The system based on this principle has good performance against multipath interference and can obtain a high data transmission rate. The computer simulation shows that successful signal transmission of 25 bit/s data rate, over 5 km distance and at 0dB signal to noise ratio, can be achieved, the error coding probability is very low.

Keywords: acoustic channel, multi-path transmission, time-frequency coding