

Underwater Wireless Communication System: Acoustic Channel Modeling and Carry Frequency Identification

Abstract

This paper demonstrates the modeling of seawater acoustic channel to obtain the optimum carrier frequency for autonomous underwater vehicle (AUV) wireless communication system. The wireless communication distance of an AUV with its control vessel changes due to the mission at different depths. Current AUV is designed with an operating depth of 0 to 2000m. Therefore, the existing model had limitation when the operational depth varies based on the mission assignment. This is because the optimum frequency to noise ratio changes with respect to the distance of the transmission. To overcome the existing modeling method, this paper presents a ameliorate method to determine the optimum carrier frequency for the AUV wireless communication system. The mathematical model with the relation of noise, distance and frequency is formulated and simulation carried out to set the optimum frequencies at various distances. From the frequency band, the average frequency is identified as the optimum transmission carries frequency. The determined frequency will be utilized for further hardware improvement.