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Investigation and evaluation of acoustic-communication synchronization method for shallow-water long-range applications

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Abstract

In this paper investigation of acoustic-communication synchronization method for shallow-water data communication is presented and a method is proposed and is evaluated for long-range applications. The proposed method is based on A) an empirical methodology and B) borrowing the concept of the television synchronization method. In proposed method, a mechanism is adopted in packet structure by which the receiver synchronizer extracts the beginnings of the transmitted packet through the communication task. Because of the acoustic nature of the channel (underwater communication channel) and non-applicability of EM propagation in water, the terrestrial synchronization methods (such as TV synchronization method) are not suitable for underwater applications, so the proposed method is effective for shallow-water acoustic communication. Main contribution of the paper is the proposal of a novel synchronization protocol for medium to long-range shallow-water (acoustic) data-communication systems. In order to evaluate the proposed method and protocol, a FSK acoustic modem (medium-range class) was developed which the results show the effectiveness of the proposed method and protocol for medium up to long-range acoustic data communication.

Keywords: Communication, Acoustic, Underwater, Shallow water, Synchronization.

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