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(Research Article)
Determining source level directivity of a passenger ship with the data of the hydrophone array in the shallow water environment

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Abstract

Underwater noise radiated by ships is one of the main sources of marine ambient noise and acoustic pollution for marine habitats. Thus, it is essential to determine and assess this type of noise. This study measured the source level directivity of a passenger ship at the frequency band ⅓ octave centered around 63 and 125 in a shallow water environment in the Persian Gulf. To receive the underwater noise of the target ship, a bed-mounted hydrophone array was used. The obtained data were compared with the data from a single B&K-8106 hydrophone located in the middle of the array. The results suggested that if accurate sound propagation modeling and AIS data are available, it is possible to calculate the source level of ships in shallow water using the bed-mounted hydrophone array. It was also observed that there is significant variability in the directivity curves at two frequencies of 63 and 125 Hz so that the source level in the angular range of 90° to 165° and 195° to 270° has higher values compared to other angle ranges. That is, there is more noise at the ship stern than at its front.

Keywords: Source level, Hydrophone array, Directivity, Underwater noise radiated.

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