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Modelling of Hydrophone Based on a DFB Fiber Laser

Lars V. Hansen(1), F. Kullander(2)

(1) *Technical University of Denmark, Department of Mechanical Enineering, Denmark*
(2) *FOI, Swedish Defence Research Agency, Department of Laser Systems, Sweden*

This paper deals with modeling of a DFB fiber laser based hydrophone. Both an analytical and a finite element model are developed to describe the acoustic response of the hydrophone. Results from the finite element model are compared to the analytical results. The small dimensions (length 3–6 cm) and low frequency noise properties of DFB fiber lasers make them useful as hydrophones. Generally, for underwater surveillance applications or similar tasks the acoustic pressure sensitivity of the fiber laser needs to be enhanced by more than two orders of magnitude. Our models predict that this can be achieved by an intermediating amplifying mechanical mounting.

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