

		Journal of the Japan Society of <b>Naval Architects and Ocean Engineers</b>			
		The Japan Society of Naval Architects and Ocean Engineers			
<a href="#">Available Volumes</a>   <a href="#">Japanese</a>				>> <a href="#">Publisher Site</a>	
Author:	<input type="text"/>	<a href="#">ADVANCED</a>	Volume	Page	
Keyword:	<input type="text"/>	<input type="button" value="Search"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Go"/>



[TOP](#) > [Available Volumes](#) > [Table of Contents](#) > Abstract

ONLINE ISSN : 1881-1760

PRINT ISSN : 1880-3717

**Journal of the Japan Society of Naval Architects and Ocean Engineers**

Vol. 1 (2005) pp.17-26

[\[Image PDF \(2820K\)\]](#) [\[References\]](#)

## Observation of Artificial Structures by Autonomous Underwater Vehicle

[Toshihiro Maki](#), [Hayato Kondo](#), [Tamaki Ura](#), [Yoshiaki Nose](#) and [Takashi Sakamaki](#)

(Accepted April 28, 2005)

**Summary:** There is a great demand for Autonomous Underwater Vehicles (AUVs) not only for wide area surveys but also for condition surveys of artificial underwater structures such as breakwater caissons, pillars, ship hulls, and installations of offshore oilfields. This paper proposes a navigation method for AUVs operating around structures, whose major configuration is given in advance. By referring to sensory data and the map of the environment where the AUV is deployed, the method enables it to localize in real-time and follow pre-given way-points without any external help as needed for conventional acoustic positioning method. Probabilistic approach called "Particle filter" utilizes multi-sensor data to realize robust and stable navigation even at harsh condition where single sensor systems might fail. This method was implemented on the AUV "Tri-Dog 1" and experiments were carried out around breakwater caissons at the mouth of Kamaishi bay, Iwate Prefecture. The vehicle took accurate images of the surface of a caisson, foot protection blocks, and rock mound. Mosaics of the bottom and the surface of the caisson are made from these images based on the precise vehicle's position estimated at each time of the mission and their quality verifies the performance of the method. This is the first time in world that caissons have ever been observed fully autonomously by an AUV.

[\[Image PDF \(2820K\)\]](#) [\[References\]](#)

Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

Toshihiro Maki, Hayato Kondo, Tamaki Ura, Yoshiaki Nose and Takashi Sakamaki:  
Observation of Artificial Structures by Autonomous Underwater Vehicle , Journal of the Japan  
Society of Naval Architects and Ocean Engineers, (2005), Vol. 1, pp.17-26 .

Copyright (c) 2006 The Japan Society of Naval Architects and Ocean Engineers

---



---

[Japan Science and Technology Information Aggregator, Electronic](#)

