ID35- UNDERWATER ROBOTICS READY FOR OIL SPILL, AN EU PROJECT

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Underwater Robotics ready for Oil Spill (URready4OS) is an european proyect aimed to set up an heterogeneous robotic system of unmanned vehicles: autonomous underwater vehicle (AUV), unmanned surface vehicle (USV) and unmanned aerial vehicle (UAV) extended with the oil spill numerical modeling, visualisation and decision support capabilities. The first experiment within the project, using oil spill simulated with Rhodamine WT, was held in Croatia during the early autumn 2014.
The objectives of this experiment were to test: effectiveness of the system for underwater detection of hydrocarbons, multi-vehicle collaborative navigation and communication and visualisation of the system agents and mission results.
In June 2015 another expriment was carried out in waters off Cartagena on board of the Clara campoamor Vessel (Spanish Maritime Safety Agency, SASEMAR). Several missions were designed and performed. Here we will show the main results achieved, the advantages and benefits from this fleet of vehicles and the steps forward to be fully operative in emergencies at sea.

ID36- TESTING SPARUS II AUV, AN OPEN PLATFORM FOR INDUSTRIAL, SCIENTIFIC AND ACADEMIC APPLICATIONS

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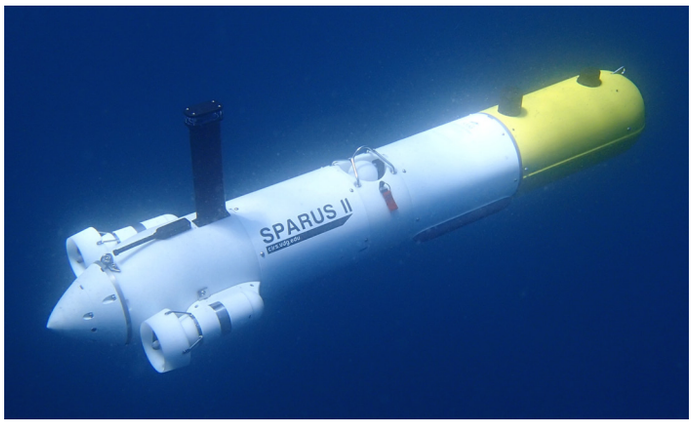

Abstract – This paper describes the experience of preparing and testing the SPARUS II AUV in different applications. The AUV was designed as a lightweight vehicle combining the classical torpedo-shape features with the hovering capability. The robot has a payload area to allow the integration of different equipment depending on the devices and systems. Its flexibility, easy operation and openness makes the SPARUS II AUV a multipurpose platform that can adapt to industrial, scientific and academic applications. Five units were developed in 2014, and different teams used and adapted the platform for different applications. The paper describes some of the experiences in preparing and testing this open platform to different applications.

Keywords – Autonomous Underwater Vehicle, vehicle design, hovering Unmanned Underwater Vehicle.

I. INTRODUCTION

Commercial AUVs are mainly conceived to surveying applications in which large areas must be covered and the vehicle follows safe paths at safe altitudes. However, new advances in sonar technology, image processing, mapping and robotics will allow more complex missions, in which the AUV will be able to navigate at a closer distance from the seabed, it will react to the 3D shape of the environment, and it will even perform some autonomous intervention tasks. In this context, the Underwater Robotics Research Centre of the University of Girona has been developing several AUV prototypes during more than 15 years to achieve these new capabilities. The SPARUS Autonomous Underwater Vehicle (AUV) was conceived in the Underwater Robotics Research Centre (CIRS) of the University of Girona (Spain). The first version was designed in 2010 to participate in the European Student AUV competition, organized by CMRE in La Spezia (Italy). The robot won the competition and, since then, it has collaborated in several research projects. In 2013, a new version of the robot, SPARUS II AUV (Figure 1), was designed and 5 units were developed in 2014 for several research institutions. Three of them were specially developed for the euRathlon competition, in which teams learned the operation of the robot and adapted its use to the competition. This paper describes the experiences after more than one year testing the platforms and adapting them to different applications.

II. SPARUS II DESIGN

SPARUS II AUV (see Figure 2) is a lightweight hovering vehicle with mission-specific payload area and efficient hydrodynamics for long autonomy in shallow water (200 meters). It combines torpedo-shape performance with hovering capability. It is easy to deploy and to operate. The payload area can be customized by the end-user and it uses an open software architecture, based on ROS, for mission programming. Its flexibility, easy operation and openness makes the SPARUS II AUV a multipurpose platform that can adapt to industrial, scientific and academic applications. The key points of the vehicle are: a) torpedo-shape movement with efficient hydrodynamics and long autonomy; b) hovering capability for high maneuverability; c) lightweight vehicle, similar weight and size than underwater gliders; d) easy operation, which can be operated by 2 persons