

The project is currently in the phase of improve the design of the absorber and the preparation of an experimental prototype (see Figures 1 and 3).

REFERENCES

[1] OEPM. Oficial Española de Patentes y Marcas. Boletines OEPM / Energía marinas / Primer trimestre 2015. [http://www.oepm.es/export/sites/oepm/comun/documentos\\_relacionados/Boletines/energias\\_marinas/2015\\_1\\_Trimestre\\_Energias\\_Marinas.pdf](http://www.oepm.es/export/sites/oepm/comun/documentos_relacionados/Boletines/energias_marinas/2015_1_Trimestre_Energias_Marinas.pdf)  
[2] M. Lafoz, M. Blanco, P. Moreno –Torres, G. Navarro, C. Vázquez y L. García –

Tabarés. Development of a project for direct conversion of wave energy into electricity. Ingeniería Civil. 2014;176: 5-12.  
[3] OES. Ocean Energy Systems. Informe anual 2014. <http://report2014.ocean-energy-systems.org/country-reports/spain/research-and-development/>  
[4] Sorensen, R.M (2006). Basic Coastal Engineering. Chapter 2: Two-Dimensional Wave Equations and Wave Characteristics. Springer US. Online ISBN: 978-0-387-23333-8.  
[5] Puertos del Estado. Government of Spain. <http://www.puertos.es/eses/oceanografia/Paginas/portus.aspx>

# ID49- A DRONE BASED SYSTEM FOR SURVEILLANCE APPLICATIONS IN COASTAL ZONE.

Adrián Cantero<sup>123</sup>, David Gallego<sup>127</sup>, Pedro López<sup>129</sup>, Rafael Molina<sup>130</sup>, Gonzalo Sánchez<sup>128</sup>, Agustín Sueldo<sup>124</sup>, Antonio Guerrero<sup>125</sup>, Antonio Guillamón<sup>126</sup>

**Abstract-** This paper introduces an unmanned aircraft vehicle (multicopter) for coastal applications. This vehicle has surveillance purposes, and it is configured with routes in such a way that the vehicle is capable of displaying them automatically, transferring information in real time to a base station. In this paper the applicable regulations about this kind of applications are analyzed.

**Keywords-** Multicopter, drone, surveillance,

I. INTRODUCTION.

Technology has been approaching and marking our lives for centuries, reaching up to a point in which we have seized it with great strength. This dependency, somewhat, does not become an issue to us, since with a proper use of technology, an improvement in the quality of life of the human being is achieved. Nowadays, the usage of drones is spreading, looking for its place depending on their usefulness. The drone applications are diverse, from military use to video recording for films or professional aerial cartography. Nevertheless, in vigilance and rescue where the use of drones are being forgotten and would have a place welcomed and acknowledged. In this issue is where drones, aerial and submarines both, could perform rescue activities, such as carrying a life vest or helping in searching for missing people, due to aerial drones has a better accessibility in complicated areas where it is hard to visualize form a helicopter and get there, or even carry a DEA (automated defibrillator) / DESA (semiautomated defibrillator), so that if the victim were in cardiorespiratory arrest, it could keep him alive until the life-sustaining support arrives. Vigilance and rescue in coastal zones are areas where the usage of drones must be present, due to any advance in technology which improves the quality of life as prevention, safety, and physical integrity get reinforced, is worth to be encouraged.

II. UPCT DRONE TEAM

UPCT Drone Team is a student association whose purpose is to promote new technologies of unmanned vehicles among students. Six students from Universidad Politécnica de Cartagena take part in this association.

III. SYSTEM DESCRIPTION.

The drone is a multicopter with 4 blades (65x65 cm), height of 25,4cm and weight of 700gr. Made of plastic, with a maximum load capacity of 500gr. The drone includes a GoPro camera hitched to a gimbal, which allows the camera to orient in a range of 180 degrees. In the picture a photograph of the vehicle is shown:

IV. APPLICABLE REGULATIONS.

The current regulation in Spain allows research and development activities, as well as aerial observation and surveillance including recording. However, this kind of activities are restricted to unpopulated areas and not controlled airspace. Flying in the proximity of seashores and sea is allowed. A license is required in order to be authorized to pilot drones, as long as aircrafts weight do not exceed 25kg. In addition, activities must be carry out with suitable light, with a maximum height of 120m. Any activity in which the drone uses airspace must be authorized by AESA.

REFERENCES

[1] BOE Ley 18/2014. Sección 6ª Artículo 50.  
[2] BOE Ley 18/2014. Sección 6ª Artículo 51.

