

# **Abstract**

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## **An Artificial Generation of Regular and Irregular Sea Wave: New Design Simulator and Experimental performance**

In recent years, an amplified global awareness has led to a reawakening of interest in renewable energy technology. In an effort to reduce the worldwide dependence on fossil fuels, cleaner power generation methods are being sought in the field of solar, biomass, wind and wave energy. The importance of wave energy is increased in particular in some countries like UK, Portugal, Spain and Japan. A considerable progress has already been achieved in this field but the available technical designs are not adequate to develop reliable wave energy converters. Wave energy is the most available energy associated in water seas and oceans. Simultaneously, the wave energy has consisted of two types of energies: potential and kinetic energy. Therefore, many attempts have been applied to capture these energies. In the present work, a wave generator device has been designed and manufactured to simulate and generate the heaving motion of sea waves with different specification. A PC based electro-pneumatic control system was designed and implemented to individually control wave height, these heights are 3, 8, 16, 18 and 20 cm and different frequencies to generate these regular and irregular waves.