



DETRMINATION OF A PLUNGER TYPE WAVE MAKER CHARACTERISTICE IN A TOWING TANK

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ABSTRACT

Regular and irregular waves are generated at small scales in laboratories using various wave makers. In the present work, characteristics of a plunger type wave maker in towing tank in Subsea Research and Development Center (SRDC) of Isfahan University of Technology (IUT) are obtained. Parameters of waves are measured using resistive wave probes after being calibrated. To calibrate wave probes, a relation between wave elevation and output voltage of probes is obtained. This is employed to develop a computer program to calculate the wave parameters such as wave height, wave period and wavelength. To verify the achieved results, video and still cameras were also used.

INTRODUCTION

All coastal and offshore structures such as sea walls, break waters, oil platforms, etc, are directly or indirectly affected by waves. Also due to broad requirements of coastal engineering, knowledge of the magnitude and behavior of waves at site is an essential prerequisite for almost all activities in the ocean including planning, construction and operational harbor, offshore and coastal protection structure [1]. Instead of studying behavior of the marine structure prototypes in the presence of waves, it is usually preferable to use their small scale models in laboratories. One of the advantages of performing the model tests in the laboratories is that it provides necessary tools to study; wave energy effects near coastal structures, reflection and transmission phenomenon on break waters, hydrodynamic forces exerted on floating bodies, etc. It is therefore required that waves be generated with specific characteristics in laboratories. These waves are usually generated in towing tanks or wave basins, using a wave maker which is composed of an electro mechanical mechanism. Different types of wave makers include piston, flap, pneumatic, paddle, and plunger types. A plunger type wave maker is made of a solid submerged body which oscillates vertically into water surface. This vertical motion causes water displacement which in turn generates waves. The plunger cross section could be in different