



Spectral Analysis of shallow water waves in Persian Gulf

[Said . Mazaheri *سعيد مظاهري*]

[Zeinab Sadat . Ghaderi *زينب السادات قادري*]

[Masoud . Rahimian *مسعود رحيميان*]

[Jalal . Rafie Shahraki *جلال رفيعي شهرکي*]

Keywords: *Wave measurement Instruments, Wave spectrum, Persian Gulf*

ABSTRACT

Persian Gulf is a large semi-enclosed bay located in the Middle East and surrounded by Iran, Iraq, Kuwait, Saudi Arabia, Qatar, Bahrain, United Arab Emirates and Oman. The spectrum of wind-waves which are very important for the design of marine structures is affected by the relatively shallow water basin and also by the surrounding topographies.

The Persian Gulf wave spectrum might not necessarily be defined by known spectrums such as Bretschneider, Pierson-Moskowitz, JONSWAP and others. In this paper it is attempted to compare the measured wave spectrums with some of the well-known spectrums i.e. Bretschneider, Pierson-Moskowitz, JONSWAP, JONSWAP (edited by Ochi), Scott and TMA. Furthermore, it is tried to express a formula which can describe the wave spectrum in Persian Gulf. As part of monitoring research project in Persian Gulf, some shallow and deep water wave stations were installed close to the Iranian coastlines. One year continues wave parameters were measured and collected from those stations. The collected data was processed and analyzed. Then, for each hour of the measured data the wave spectrum was obtained. Each wave spectrums which got the significant wave height more than 0.5 m was selected. The selected wave spectrums were compared with six known spectrums i.e. Bretschneider, Pierson-Moskowitz, JONSWAP, JONSWAP (edited by Ochi), Scott and TMA. This procedure was done for both shallow and deep water wave stations. Comparisons showed that the measured wave spectrums were not exactly in line with the above mentioned spectrums. In addition, there are rare signs of swell waves in the trends. Meanwhile, effects of local wind waves always can be seen in higher band frequency of the wave spectrum. Based on the results it is attempted to find the best fitted standard spectrum by some modifications to determine the wave spectrum in the Persian Gulf.

1. INTRODUCTION

Persian Gulf coastal waters are being used widely by the oil and gas industries besides the ports and harbor. Wave spectra and wave parameters at a given location are necessary for every