

Coastal and Ocean Wave Hydrodynamics

K. N. T. University of Technology

Assignment 4

4-1.

A small harbor, open to the sea at one end, is 90m long and 10m deep at high water. What would be the effect of swell waves of period 18s arriving at the harbor mouth?

4-2.

What is the effect on the local sea level if the passage of a severe storm results to a fall in atmospheric pressure of 50 millibars? (1 bar ~ 10 m head of water)

4-3.

A constant speed of 20 m/s is blowing on a shallow bay of 800 km × 250 km. Assuming the average depth of 40 m, what is the amount of positive storm surge at boundary?

4-4.

Table lists the annual maximum wind speed at the place called “Irozaki”, which is located at the southernmost tip of Izu Peninsula. By assuming the FT-II distribution with $k=10$, make an extreme value analysis of this wind data and estimate the 100-year wind speed together with its 90% confidence interval.

Annual Maximum Wind Speed at Irozaki

Year	V(m/s)	Year	V(m/s)	Year	V(m/s)	Year	V(m/s)
1940	38.9	1955	29.9	1970	22.3	1985	28.9
1941	27	1956	30.2	1971	19.7	1986	18.4
1942	26.5	1957	27.5	1972	27.5	1987	18.2
1943	28.4	1958	38.9	1973	22.1		
1944	23.1	1959	51.9	1974	21.6		
1945	32.4	1960	25	1975	19.7		
1946	29.5	1961	25	1976	18.4		
1947	26.8	1962	21.4	1977	16.2		
1948	39.1	1963	32	1978	17.7		
1949	30.5	1964	24.3	1979	25.8		
1950	24.3	1965	26.5	1980	18.3		
1951	25.6	1966	29.9	1981	22.5		
1952	37.7	1967	25.9	1982	29		
1953	32.9	1968	22.5	1983	17.9		
1954	27	1969	22.3	1984	15.7		