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LINEAR WAVE THEORY Harald E. Krogstad and Øivind A. Arntsen Part A - regular waves pdf-file. PartB - irregular waves pdf-file. NTNU Department of Structural Engineering. Editor in Charge: oivind.arntsen@bygg.ntnu.no Last modified: February, 23. 2000 Wave Descriptions and Theory LINEAR WAVE THEORY. Harald E. Krogstad ...

Linear Wave Theory - Personal webpages at NTNU

Linear wave theory is the core theory of ocean surface waves used in ocean and coastal engineering and naval architecture. The treatment is kept at a level that should be accessible to first year undergraduate students and does not require more than elementary calculus, probability and statistics. Part A will cover the linear theory of regular gravity waves on the surface of a fluid, in our case, the surface of water.

Linear Wave Theory - NTNU

In fluid dynamics, Airy wave theory (often referred to as linear wave theory) gives a linearised description of the propagation of gravity waves on the surface of a homogeneous fluid layer. The theory assumes that the fluid layer has a uniform mean depth, and that the fluid flow is

Linear Wave Theory Ntnu - Wakati

LINEAR WAVE THEORY Part B - 5 - (J) GN= $\rho\eta p$ Var() () $\Psi N N^2$ Thus, the wave spectrum may also be seen as proportional to the wave energy distribution as a function of the wavenumber. Since $N(\cos(\theta) \sin(\theta)) \theta LM + \theta$, it is possible to write the integral for the variance in (k-) polar coordinates: $Var() () (,) \eta \theta \theta \pi = = III = = \infty \Psi \Psi N N G N N NGNG N^2 0 2$

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- Linear wave theory - wave kinematics and dynamics. - Wave statistics including wave spectrum. - Wave forces. - Ice conditions in the Barents Sea. - Some basic conditions of sea ice physics. - Methods for calculating ice loads from level ice on marine structures with oblique and vertical waterline (application of ISO 19906).

Course - Arctic and Marine Civil Engineering - TBA4265 - NTNU

Numerical modelling of wave energy converters (WECs) is currently an area of interest within the marine renewable energy industry, due to its ability to streamline design processes and accelerate scientific understanding. The presented project investigates the capacity of linear potential flow theory to accurately model wave excitation of a 2D WEC buoy-section, identifying wave conditions under which computational fluid dynamics (CFD) become a more appropriate strategy.

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Learning outcome. Knowledge: - shall have a fundamental understanding of the mathematical models used in general fluid mechanics. - shall be familiar with linear wave theory and understand how irregular ocean waves can be established from the fundamental regular components.

Course - Marine Hydrodynamics - SKID2202 - NTNU

Course content. Basic fluid mechanics: hydrostatics, water continuity, momentum equation, Bernoulli's equation, Energy equation, Navier-Stokes equation, pipe and channel flow, singular and friction losses, Manning+Chezy's equations, Darcy-Weissbachs equation, Moody's diagram, drag and lift, linear wave theory etc.

Course - Fluid Mechanics - TVM4116 - NTNU

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General linear dynamic theory, Wave theory (regular and irregular waves), Wave loads, Uncoupled motion in waves, Motion in irregular waves, Coupled heave and pitch motion, Powering in a seaway, Motion reduction in waves, Motion criteria, operability estimates, Non-linearities in wave load estimates, Station-keeping in waves, Manoeuvring of ships

Course - Ship Hydrodynamics - IP500215 - NTNU

- Linear wave theory, assumptions we do on and under the free surface - Wave forces on fixed and floating structures, small and large volume structures - Transfer function for motion of floating structures and combination with wave spectra - Natural periods and characteristics of oscillating systems on the free surface

Course - Marine Technology - Hydrodynamics - TMR4247 - NTNU

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1.1 Linear waves 1.1.1 Sinusoidal waves The first encounter with the mathematical theory of waves is usually with cosine (or sine) waves of the form $u(x;t)=a\cos(kx - \omega t)$: Here $x;t \in \mathbb{R}$ denote space and time, respectively, and the parameters a , k and ω are positive numbers. a is the amplitude of the wave, k the wave number and ω the angular frequency.

An Introduction to Nonlinear Waves

A methodology for accurately replicating measured ocean waves in a numerical model is detailed. Ocean waves are represented by a linear irregular wave at full scale. Ocean wave data from the Atlantic marine energy test site are used. The interaction between an ocean wave and a structure is explored.

Linear irregular wave generation in a numerical wave tank ...

Non-Linear Wave-Body Interaction in Severe Waves. Hanssen, Finn-Christian Wickmann. Doctoral thesis

NTNU Open: Non-Linear Wave-Body Interaction in Severe Waves

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A linearised description of the propagation of gravity waves on the surface of a homogeneous fluid layer. In fluid dynamics, Airy wave theory (often referred to as linear wave theory) gives a linearised description of the propagation of gravity waves on the surface of a homogeneous fluid layer. The theory assumes that the fluid layer has a uniform mean depth, and that the fluid flow is inviscid, incompressible and irrotational.

Airy wave theory - Wikipedia

ρ , which is a general result in linear wave theory. Since the average kinetic- and potential energies are equal for a propagating wave, the total wave energy E can be written as $E = \frac{1}{2} \rho g a^2$ (20) The energy flux, F , associated with the wave ((11) and (12)) is $F = \frac{1}{2} \rho g a^2 c$

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