Physical modelling: laboratory models

Symbol	Dimensionless Number	Force Ratio	Definition
R_e	Reynolds Number	Inertia/Viscous	$\dfrac{UL}{\nu}$
F_n	Froude Number	Inertia/Gravity	$\dfrac{U}{\sqrt{gL}}$
M_n	Mach's Number	Inertia/Elasticity	$\dfrac{U}{\sqrt{E_v/\rho}}$
W_n	Weber's Number	Inertia/Surface tension	$\dfrac{U}{\sqrt{\sigma/\rho L}}$
St	Strouhall number	-	$\dfrac{f_v D}{U}$
KC	Keulegan-Carpenter Number	Drag/Inertia	$\dfrac{U_A T}{D}$

School of Geosciences

What is XBeach?

2DH process-based model to simulate nearshore wave transformation long wave motion, sediment transport and morphological change

2 modes:

Surfbeat hydrostatic:
- nonlinear shallow water equations with radiation stress forcing from wave action equation
- resolves long waves and the amplitude variation of short waves

Non-hydrostatic:
- nonlinear shallow water equations with pressure correction
- resolves phase of long and short waves