# Analytical solution of tidal forcing in a rectangular 2D basin

Governing equation in 2D (X-Z):

1-Continuity

Assumptions:

* u, is not function of z but vertical velocity w is a function of z
* H is constant
* Ζ << H

2- Momentum

Assumptions:

* Inviscid fluid ( interfacial and bottom friction are neglected)
* Ρ=constant
* Non-rotating reference frame (f=0)

Integration will result in:

Subjected to the boundary condition u(L,t)=0

K0 must be calculated base on boundary conditions

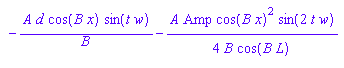
@t=0 :

and

Area = depth + amplitude\*cos(Bx)\*cos(wt)/cos(BL)

Velocity= big\_A\*sin(BX)\*sin(wt)

Q=cell averaged



Q time averaged

