

# Wave Amplification due to Current: Brevik & Aas (1980)

$$\omega = \sigma + kU = \sqrt{gk \tanh kh} + kU; \quad \omega : \text{apparent frequency}$$

$$\sigma : \text{intrinsic frequency}$$

Conservation of energy flux:  $\frac{d}{dx} [E(U + c_g)] + F_w \frac{dU}{dx} = 0; \quad F_w = E \left( \frac{2c_g}{c} - \frac{1}{2} \right)$

$F_w$  is the radiation stress.

Wave action flux for steady flows:  $\frac{E}{\sigma}(U + c_g)$  is conserved.

$$\frac{a}{a_0} = \sqrt{\frac{(c_{0g}/c_0)}{(k_0/k - U/c_0)(c_g/c) + U/c_0} \left( 1 - \frac{kU}{k_0 c_0} \right)}$$

$h = 15\text{m}$

$T = 200$  and  $300$  sec (black lines)

$30$  sec (gray line)

