November 3, 2006

PHY 711 – Problem Set # 22

Continue reading Chapter 10 in **Fetter and Walecka**.

1. In class, we showed that the velocity potential for a wave traveling in water corresponding to the surface function

$$\zeta(x,t) = \zeta_0 \sin[k(x-ct)], \tag{1}$$

is given by

$$\Phi(x,z,t) = \frac{\zeta_0 c}{\sinh(kh)} \cosh(kz) \cos[k(x-ct)]. \tag{2}$$

In these expressions, c represents the speed of the wave and obeys Eq. 54.32. Check whether this form of $\Phi(x,z,t)$ is consistent with Eq. 54.36 of your text.