

PHY 712 – Problem Set #14

Start reading Chapter 6 in **Jackson**

1. This problem relates to the evaluation of the retarded time Green's function for a charged particle as given in Eq. 6.44 of **Jackson** and in the lecture notes. Suppose that the particle trajectory is given by

$$\mathbf{R}_q(t') = \mathbf{R}_0 + \mathbf{v}_0 t',$$

where \mathbf{R}_0 and \mathbf{v}_0 are fixed constant position and velocity vectors respectively. Write an expression for the integral

$$\int_{-\infty}^{\infty} f(t') \delta(t' - (t - |\mathbf{r} - \mathbf{R}_q(t')|/c)),$$

expressing your answer in terms of the arbitrary function f and the field time t and position \mathbf{r} .