

LESSON 31 – PHYSICAL BASIS OF THE RADIATION REACTION FORCE

LEARNING OBJECTIVE:

Determine the conceptual basis for the radiation reaction force.

- 1) Describe how Equation 11.92 is derived based on the definition of retarded time given in Equation 10.18 on page 423.
- 2) Describe the physical basis for the radiation reaction force in terms of Newton's 3rd law, or, rather, the violation of Newton's 3rd law.
- 3) Until some handwaving between Equations 11.99 and 11.100, the derivation of the radiation reaction force involved looking at the unbalanced forces between different pieces of charge within the same charged object. Is it a problem for this derivation that true point charges, like [electrons](#), do exist?

4) **Note: This is a review question from Chapter 9.** Given the boundary conditions in Equation 9.74 on page 384, briefly (in 3 sentences or so) describe the process for relating the reflected, transmitted, and incident waves. What is different about this process for normal incident waves vs. oblique incident waves (specifically, which boundary conditions are important/unimportant in one case vs. the other)?

5) What did you find difficult or confusing in the pre-class work? If nothing was difficult or confusing, tell me what you found most interesting. Please be as specific as possible.

6) Document whatever help you received on the preclass work.