

Massachusetts Institute of Technology

Department of Physics

Course: 8.701 – Introduction to Nuclear and Particle Physics

Term: Fall 2020

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Discussion Problems

from recitation on **October 8th, 2020**

Problem 1: Hadron production

An impressive way to display the structure of leptons and quarks, we define R as the ratio of cross section to hadrons over the cross section to muons. a) Discuss what can be learned from this ratio. b) How would the result change if we define the ratio using the cross section to electrons. Evaluate

Problem 2: Vacuum polarization with quarks and gluons

Draw diagrams of vacuum polarization including quarks and gluons. Discuss the differences between QED and QCD vacuum polarization.

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