

# 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 September 24th, 2020

#### Problem 1: $A \rightarrow B + B$

- Is  $A \rightarrow B + B$  a possible process in the ABC theory?
- Suppose a diagram has  $n_A$  external  $A$  lines,  $n_B$  external  $B$  lines, and  $n_C$  external  $C$  lines. Develop a simple criterion for determining whether it is an allowed reaction.
- Assuming  $A$  is sufficiently heavy, what is the most likely decay mode, after  $A \rightarrow B + C$ ? Draw a Feynman diagram for each decay.

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