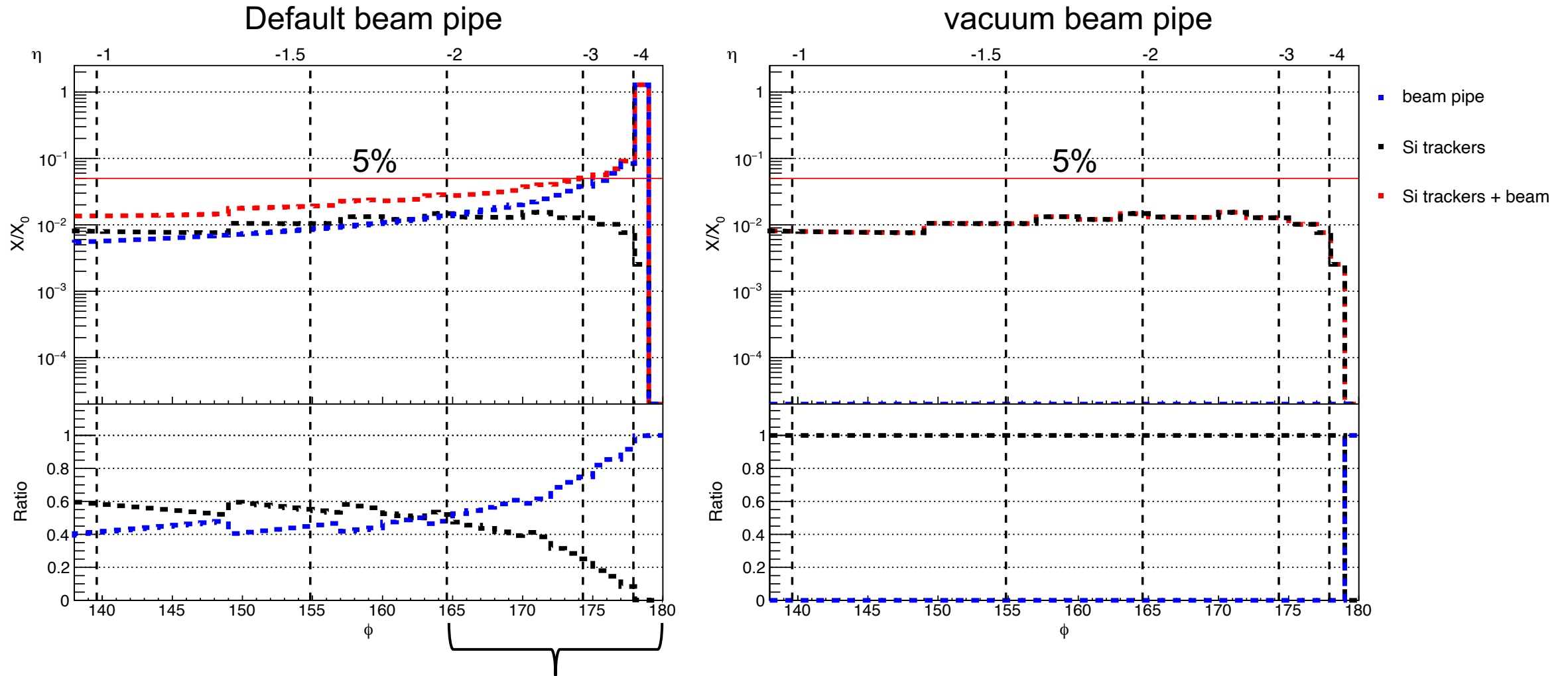


Concepts of the 2nd Detector Beam Pipe

Cheuk-Ping Wong

01-23-2024

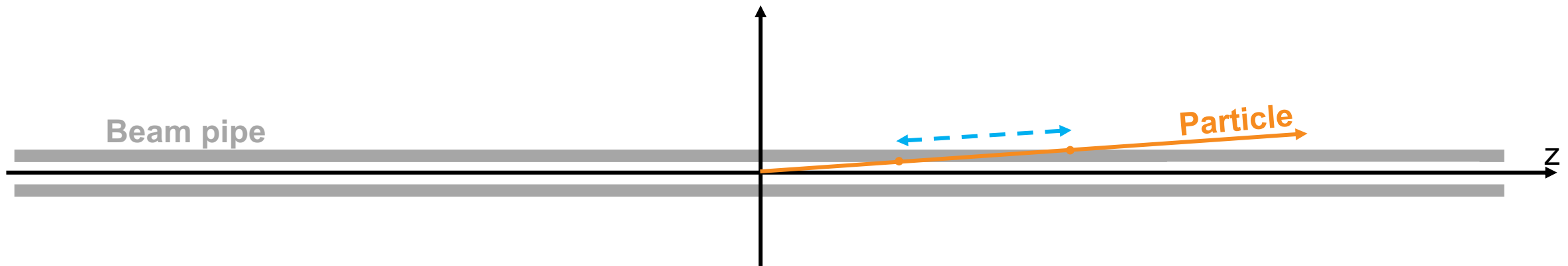
Backward Material Budgets (6 Disks)



Beam pipe is the major material contributor in $\eta < -2$

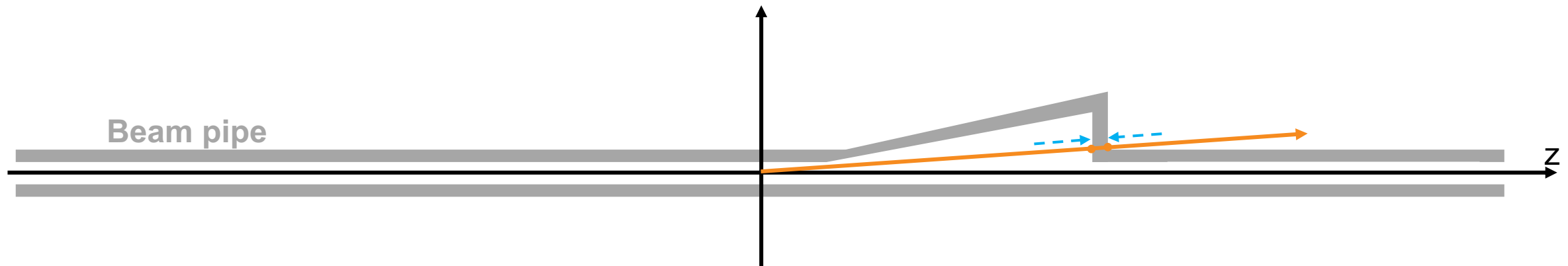
A Simple Beam Pipe

Material budget increases in the forward and backward direction



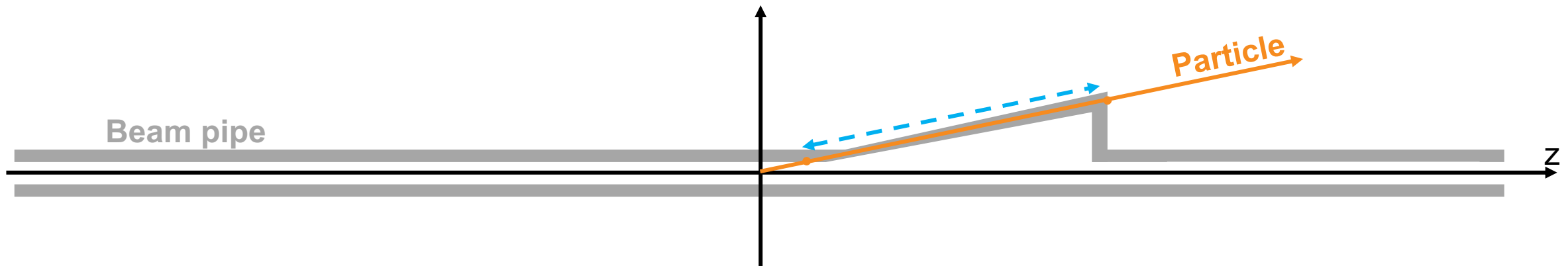
Alternative Beam Pipe Concepts: A window

- An escape window gives the smallest material budget for forward/backward particles



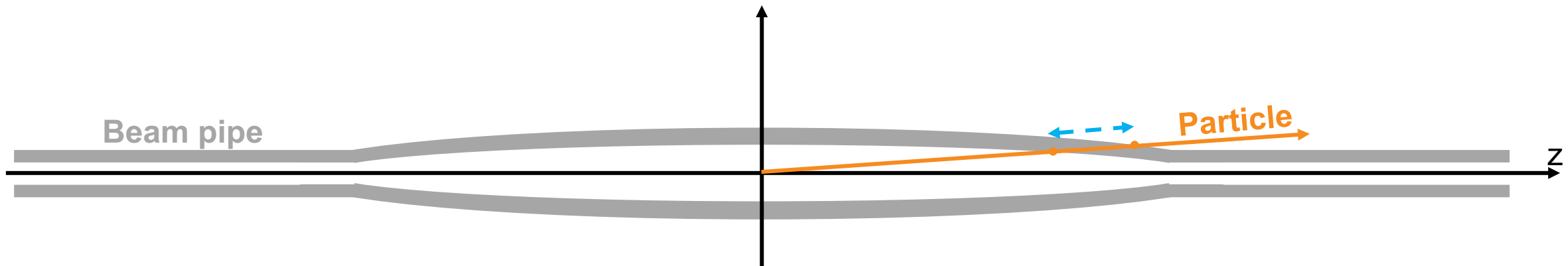
Alternative Beam Pipe Concepts: A window

- An escape window gives the smallest material budget for forward/backward particles
- However, this feature only benefits particles at a certain pseudorapidity



Alternative Beam Pipe Concepts: Rounded

A comprised beam pipe design that may work for particles at a wider pseudorapidity range



Summary

- The beam pipe is the main contributor to the backward ($\eta < -2$) material budget
- Suggested two beam pipe concepts that could reduce the backward material budget significantly
- More study is needed to determine the practicality of these beam pipe concepts