

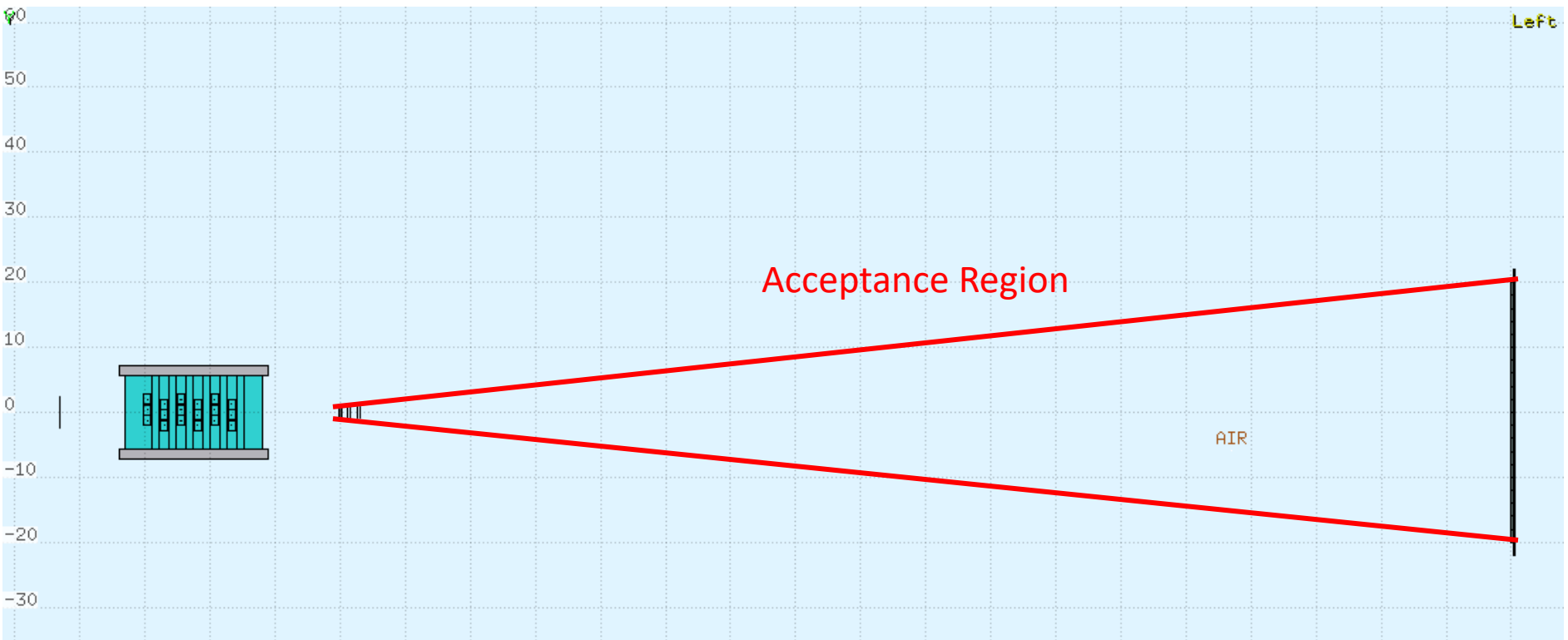
GSI 2019 Analysis: FLUKA Simulation for Efficiency Determination

Milano

In view of data analysis for cross section measurements as a function of Z

- As recently discussed we aim to analyze GSI data from 2019 campaign to extract total cross sections (and/or energy-integrated $d\sigma/d\Omega$) for the inclusive production of all different Z
- For this purpose we need to evaluate by MC acceptance, efficiency (including trigger) for all interesting cases

Efficiency Evaluation



Too much resources- and time-consuming to evaluate acceptance/efficiency starting from the primary beam simulation.

It's better to make use of an ad-hoc procedure

Ad Hoc Strategy

Individual (untriggered) simulations for each Z, to be used as primary originating from a random x,y,z within the target volume

Flat distribution in:

- solid angle within TW acceptance
- selected Z-dependent energy range (limits checked by MC):

Z=1 (p) min = 0.0 max = 1199.0 (MeV/u)

Z=2 (⁴He) min = 0.0 max = 695.5

Z=3 (⁷Li) min = 131.0 max = 508.5

Z=4 (⁹Be) min = 184.5 max = 523.0

Z=5 (¹¹B) min = 218.0 max = 453.5

Z=6 (¹²C) min = 290.5 max = 435.0

Z=7 (¹⁴N) min = 318.0 max = 413.5

Z=8 (¹⁶O) min = 352.0 max = 392.5

Hypothesis:

there is no need to have different isotopes within a single Z. The most representative/abundant one should be enough.

Is this correct?