Target Studies for Pion Production

Kinematic distributions of π's produced by a Ni target

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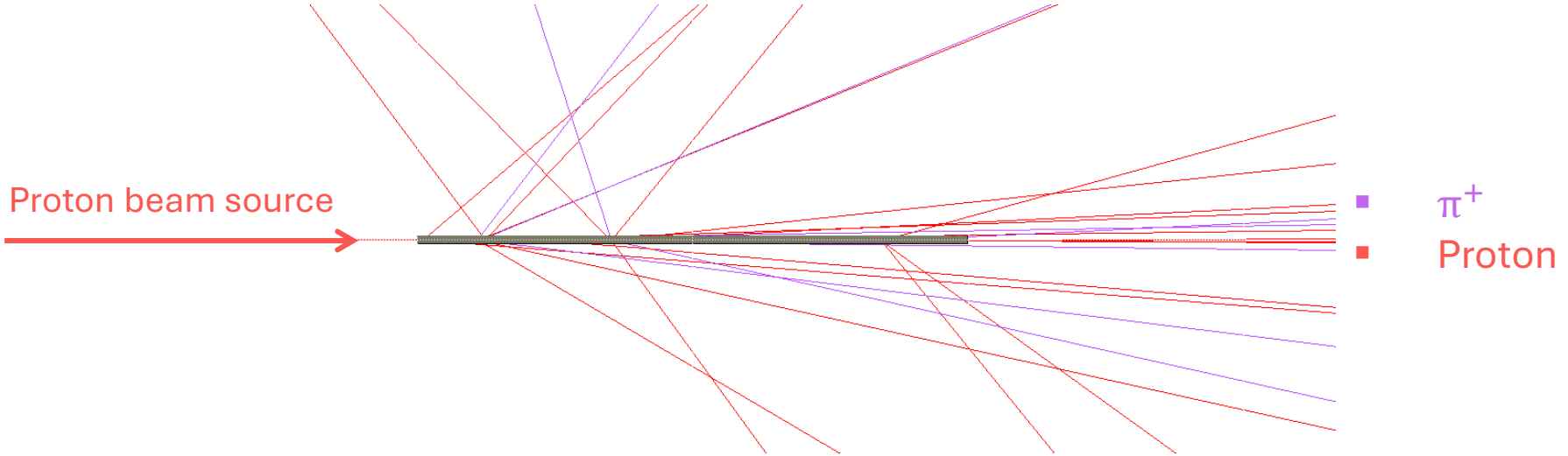
FLUKA setup

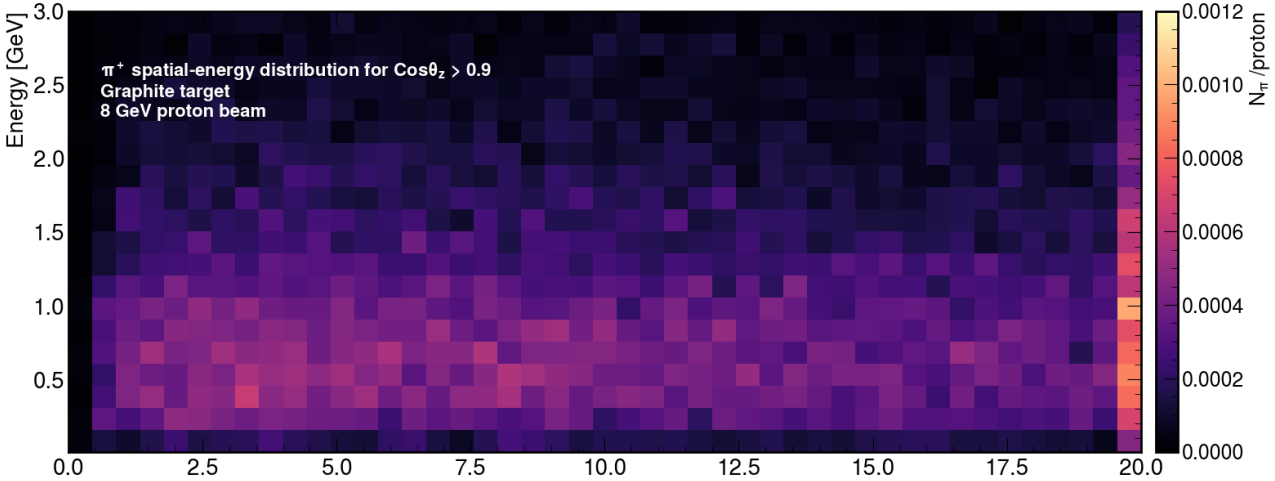
Beam	**Energy**	8 GeV
	Primaries	100,000
Target	**Length**	one interaction length
	Radius	0.15 cm
	Material	Different materials

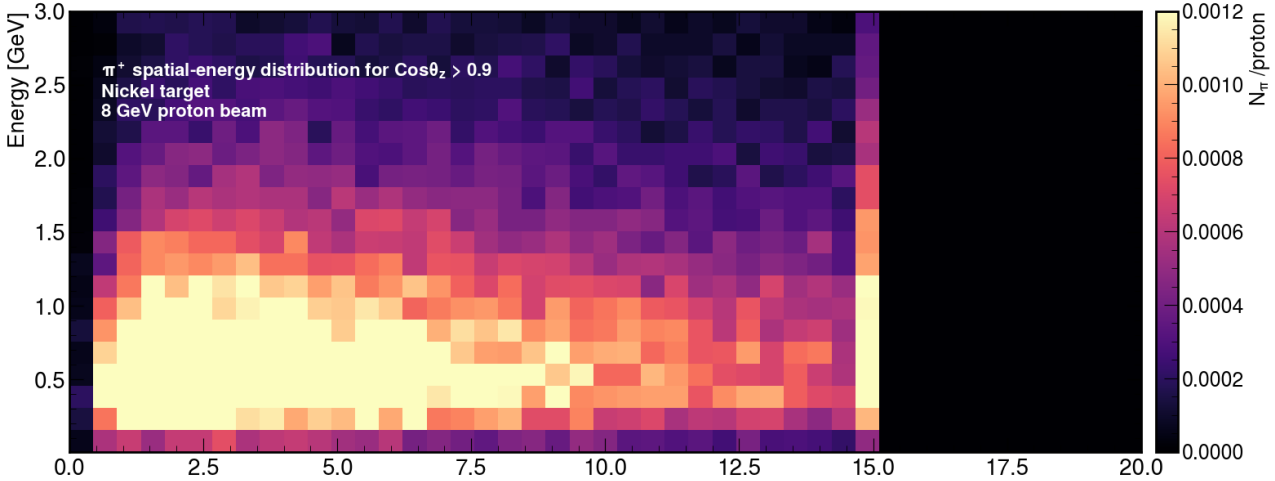


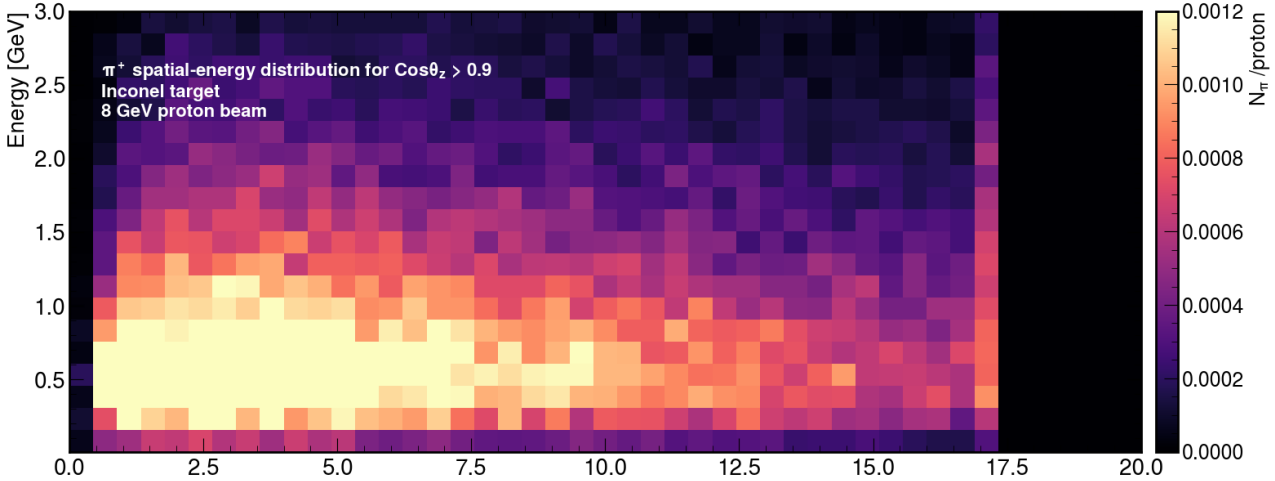
Summary of Pion production in different targets

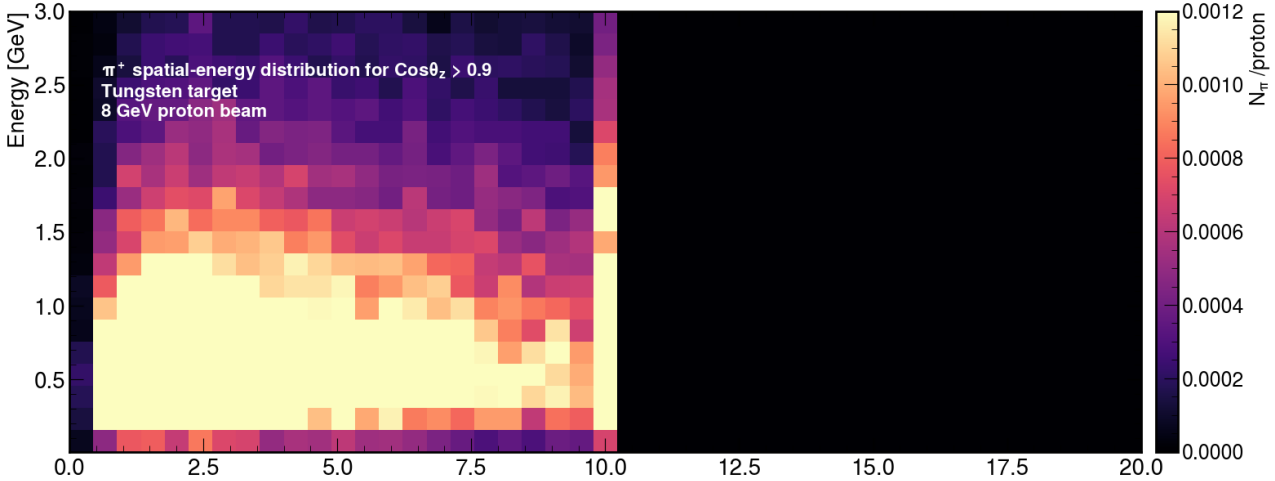
Material (one λ_{int} length)	**π^+ produced per p^+**	**π^- produced per p^+**	**π^+ escaped per p^+**	**π^- escaped per p^+**
Graphite (20 cm)	0.40	0.30	0.39	0.29
Nickel (15 cm)	0.87	0.70	0.84	0.71
Inconel (17 cm)	0.91	0.73	0.88	0.70
Tungsten (10 cm)	0.84	0.80	0.79	0.74

For Cos θz > 0.9

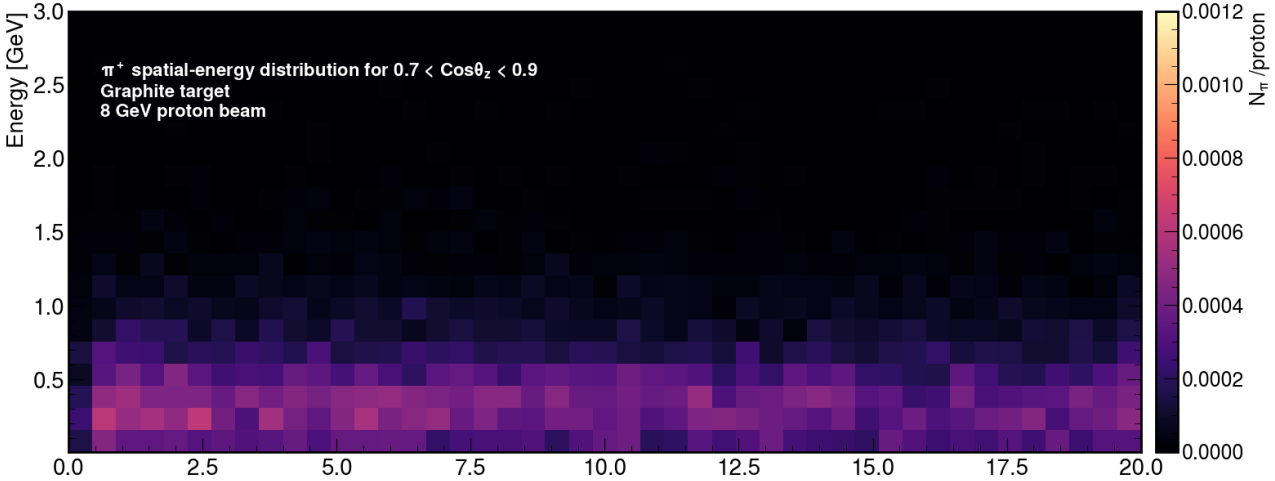

π⁺ spatial-energy distribution for Cosθz > 0.9
Graphite target
8 GeV proton beam
Energy [GeV]
Nπ /proton

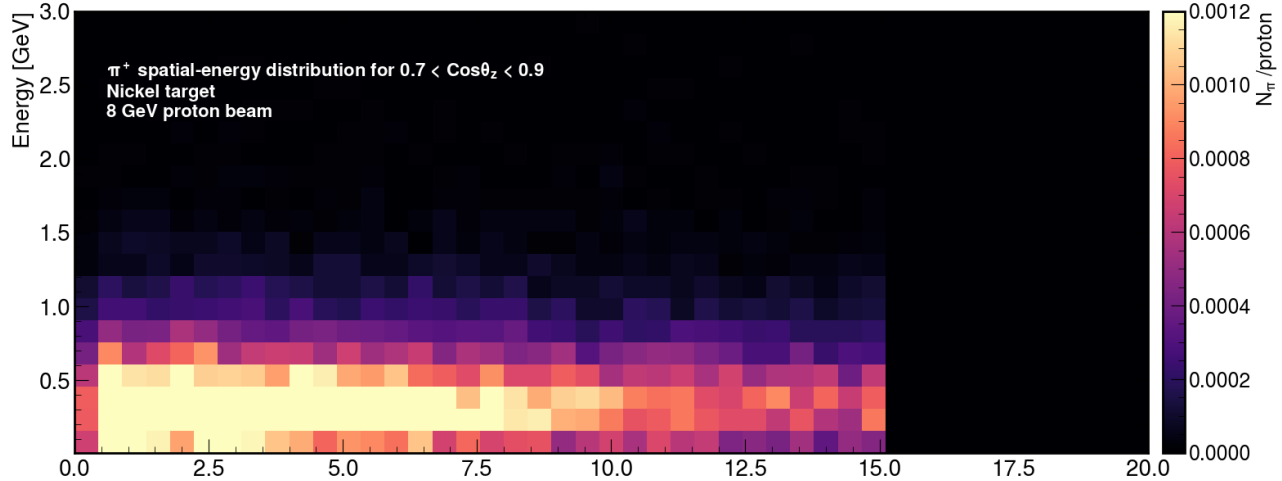

π⁺ spatial-energy distribution for Cosθz > 0.9
Nickel target
8 GeV proton beam
Energy [GeV]
Nπ /proton

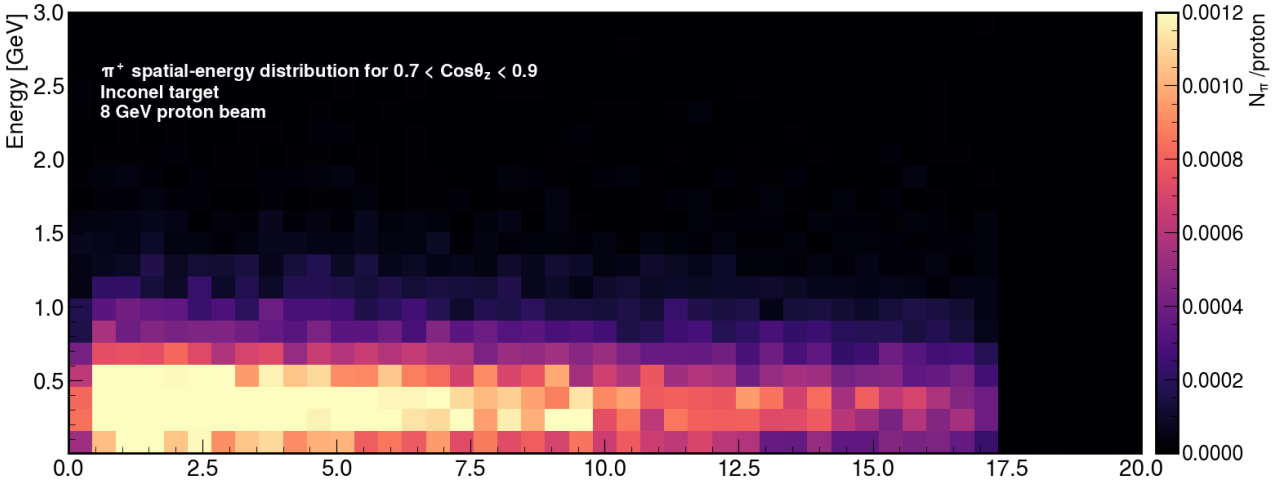

π⁺ spatial-energy distribution for Cosθz > 0.9
Inconel target
8 GeV proton beam
Energy [GeV]
Nπ /proton

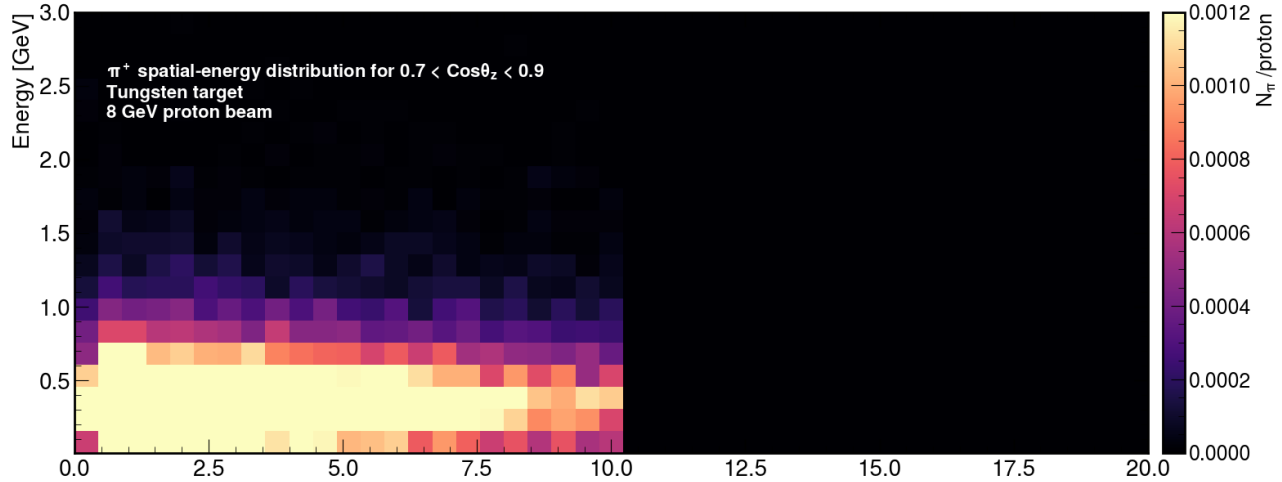

π⁺ spatial-energy distribution for Cosθz > 0.9
Tungsten target
8 GeV proton beam
Energy [GeV]
Nπ /proton

For 0.7 < Cos θz < 0.9

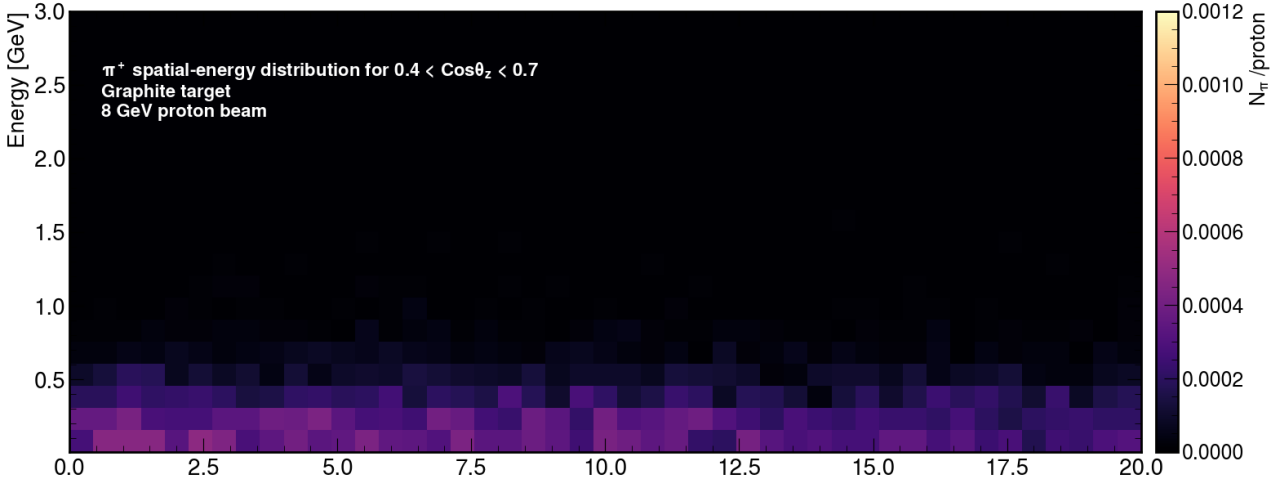


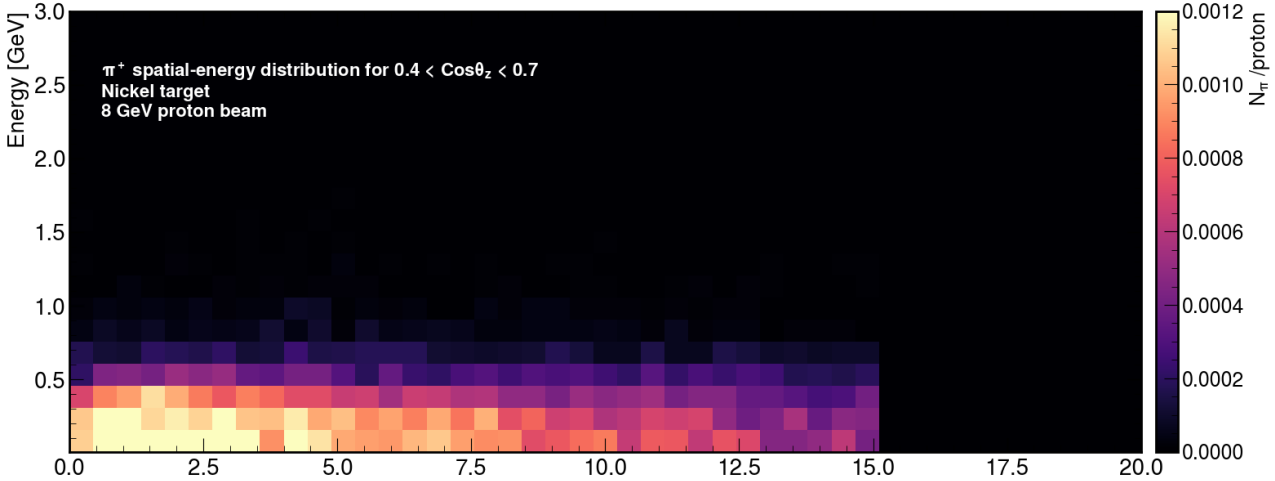


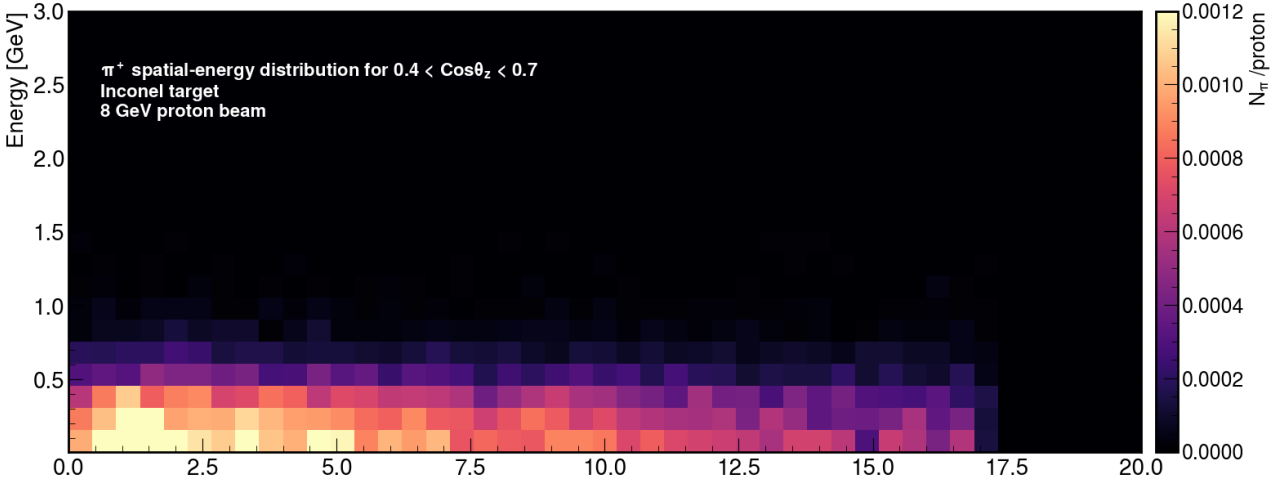


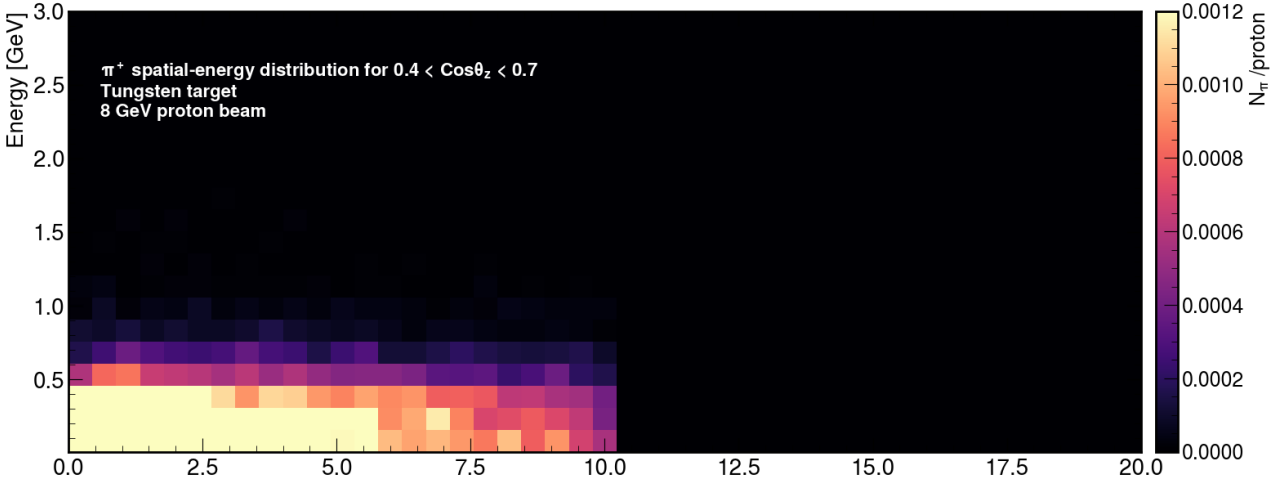


For 0.4 < Cos θz < 0.7

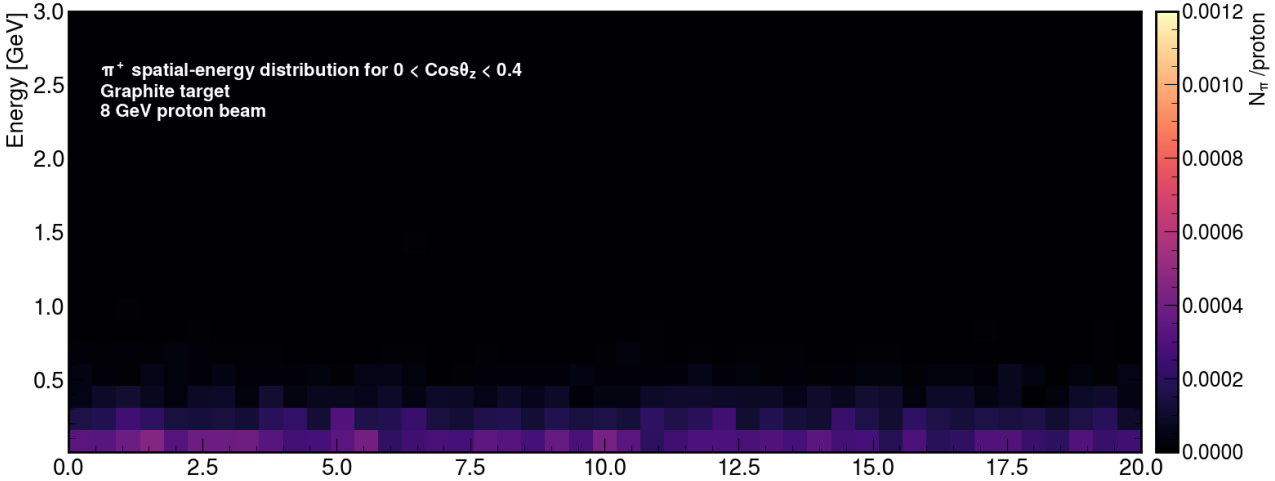


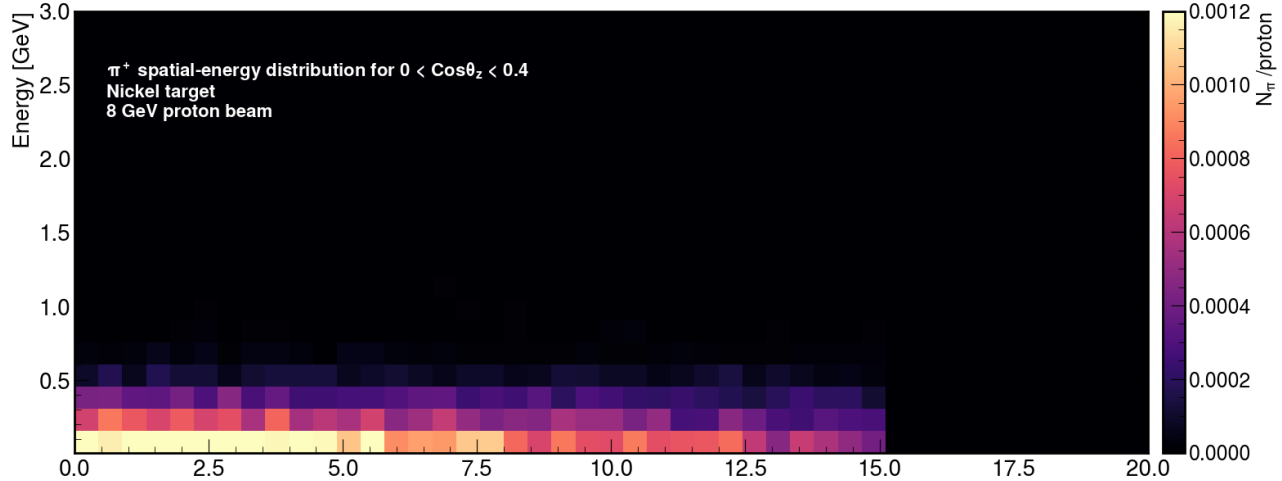


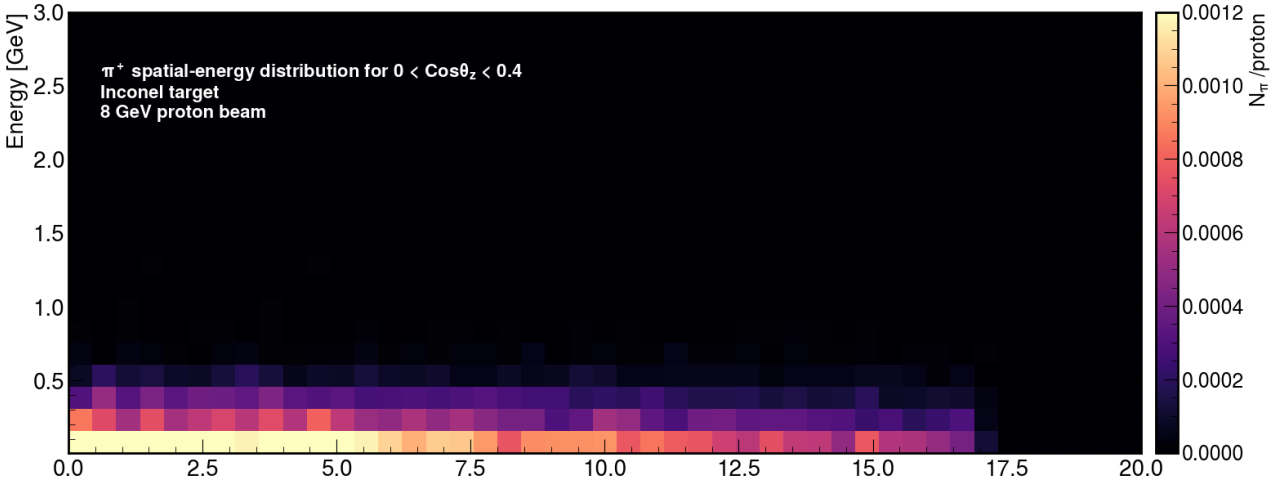


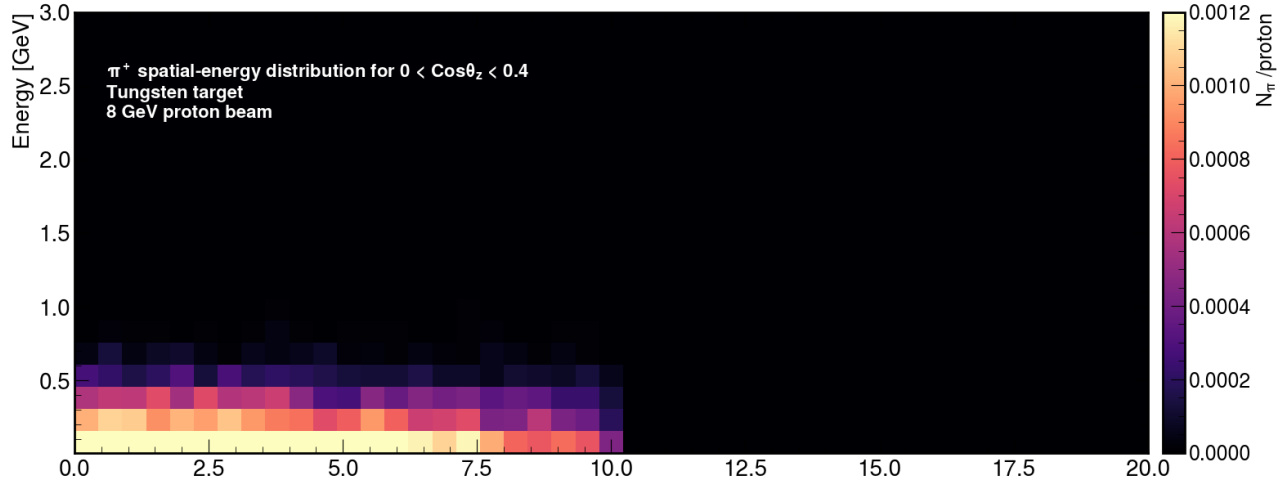


For 0 < Cos θz < 0.4









Next steps

→I received a formal review from one of my reviewers in IPAC proceedings and I have a week to work on it.

→I will start working on the magnetic field for the capture system of the muon collider demonstrator.