Galaxy Cluster Mergers: Microphysics of ICM, + Some Athena Magnetic Diverter work

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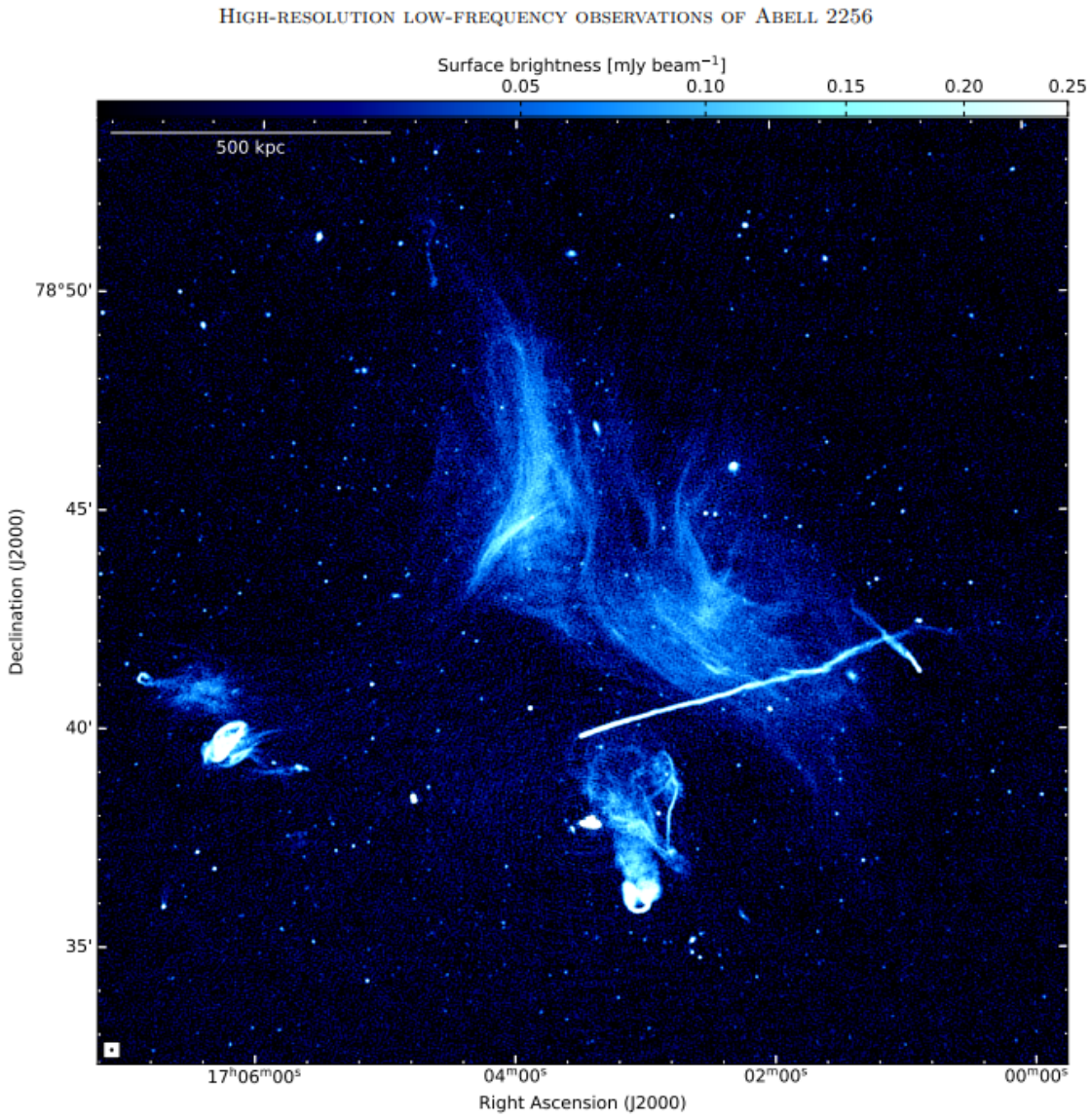
Section 1

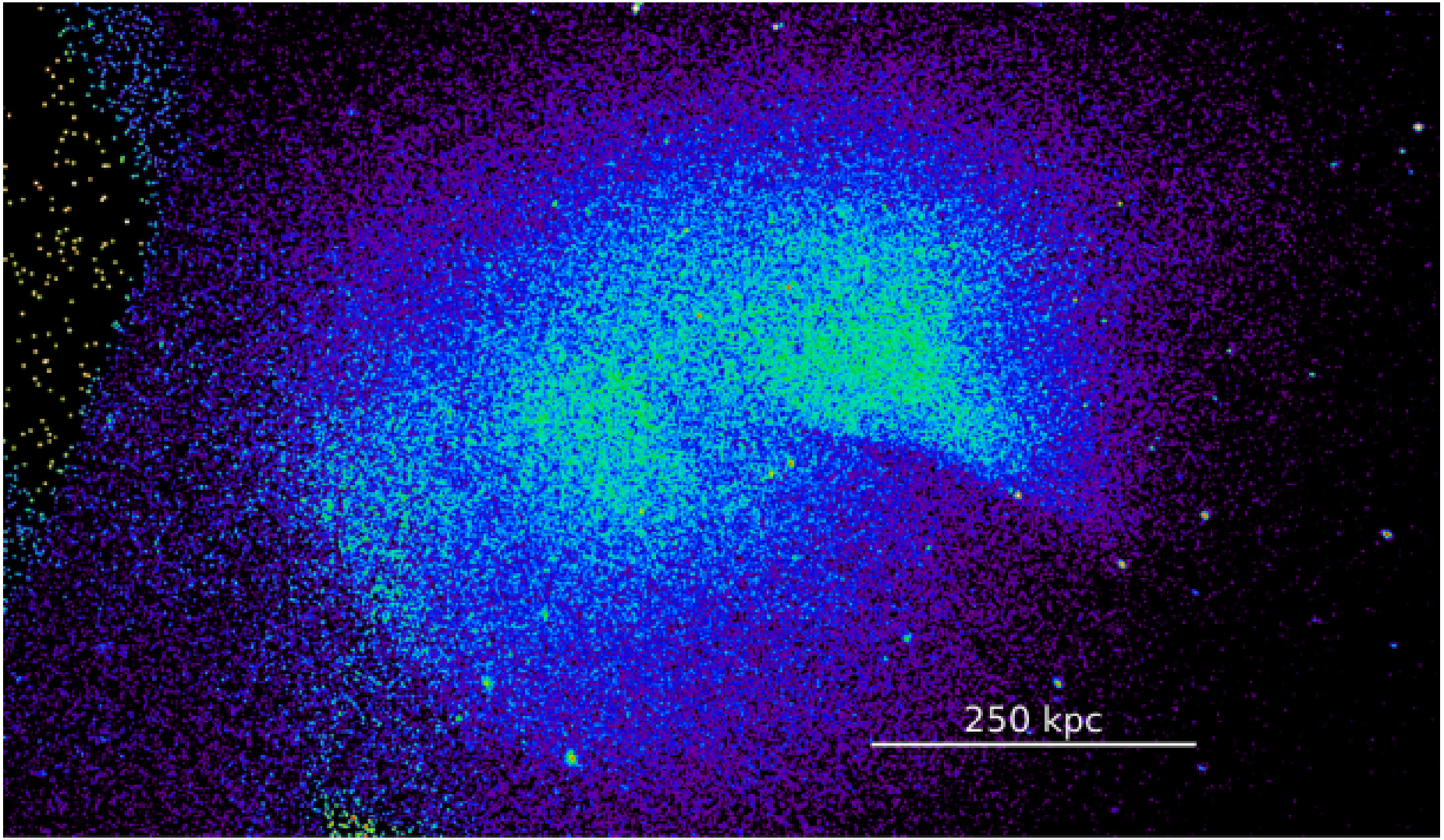
Galaxy Cluster Mergers, ICM Microphysics

- The mergers in Abell 2256: displaced gas and its connection to the radio-emitting plasma
- GC Merger Shock Simulations: https://bit.ly/ShockSupplement

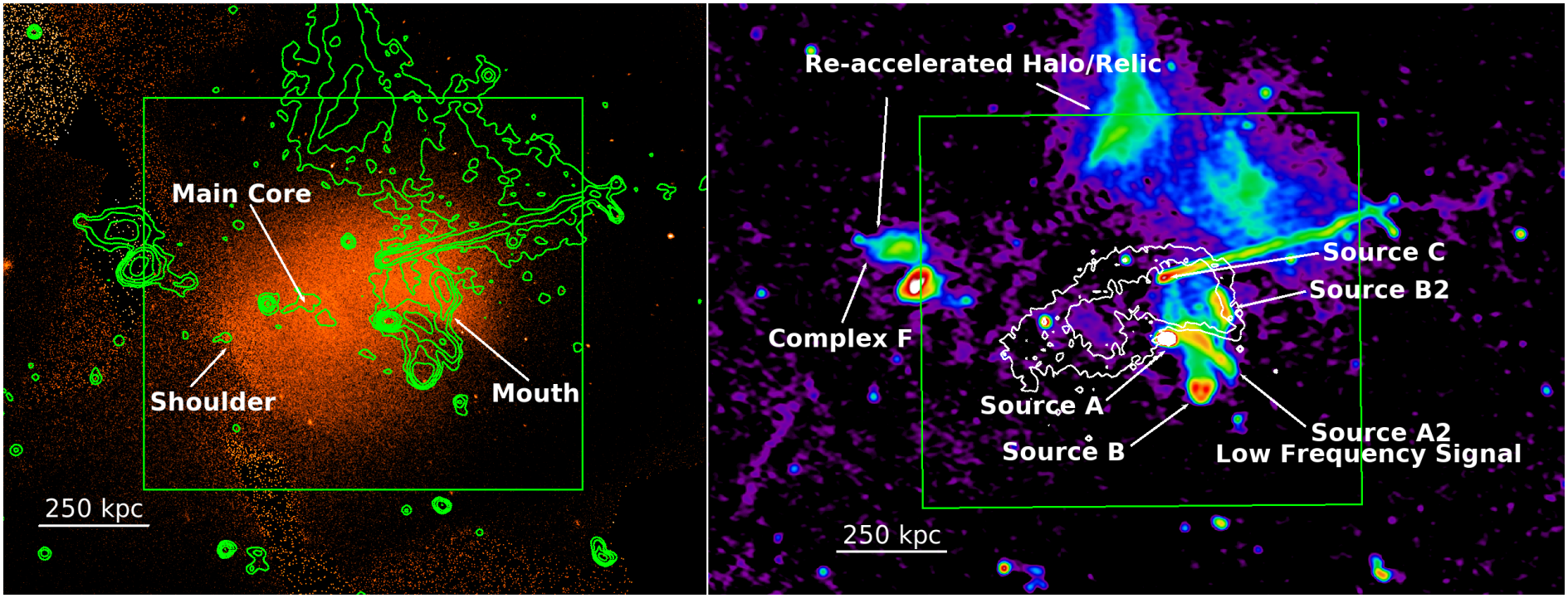
Abell 2256


High-resolution low-frequency observations of Abell 2256
Surface brightness [mJy beam^{-1}]
0.05
0.10
0.15
0.20
0.25
500 kpc
78°50'
45'
40'
35'
Declination (J2000)
17^{h}06^{m}00^s
04^{m}00^s
02^{m}00^s
00^{m}00^s
Right Ascension (J2000)

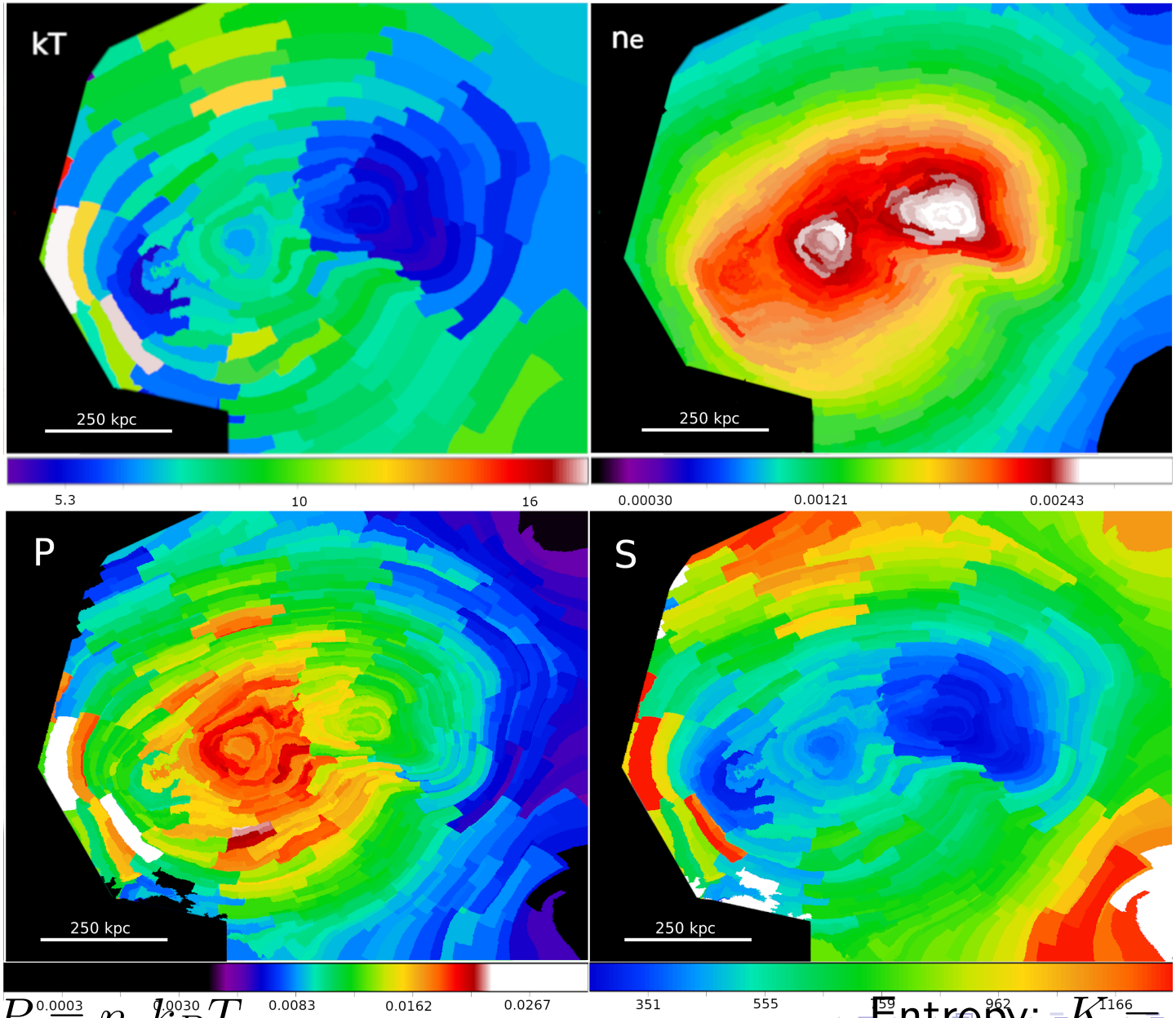
Abell 2256



Chandra + GMRT (325 MHz)



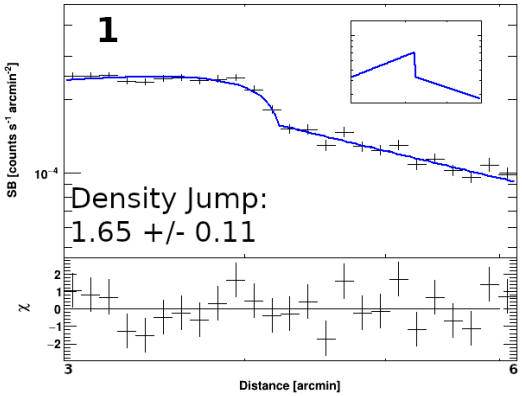
X-ray Derived Thermodynamical Maps

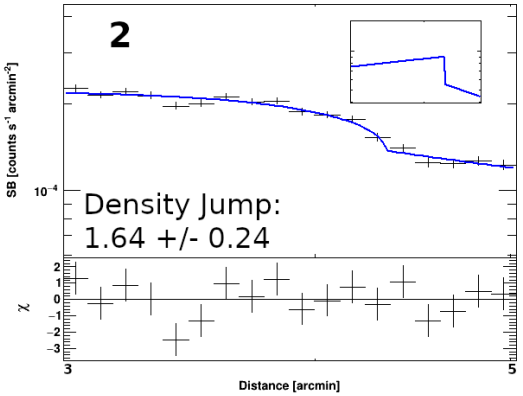


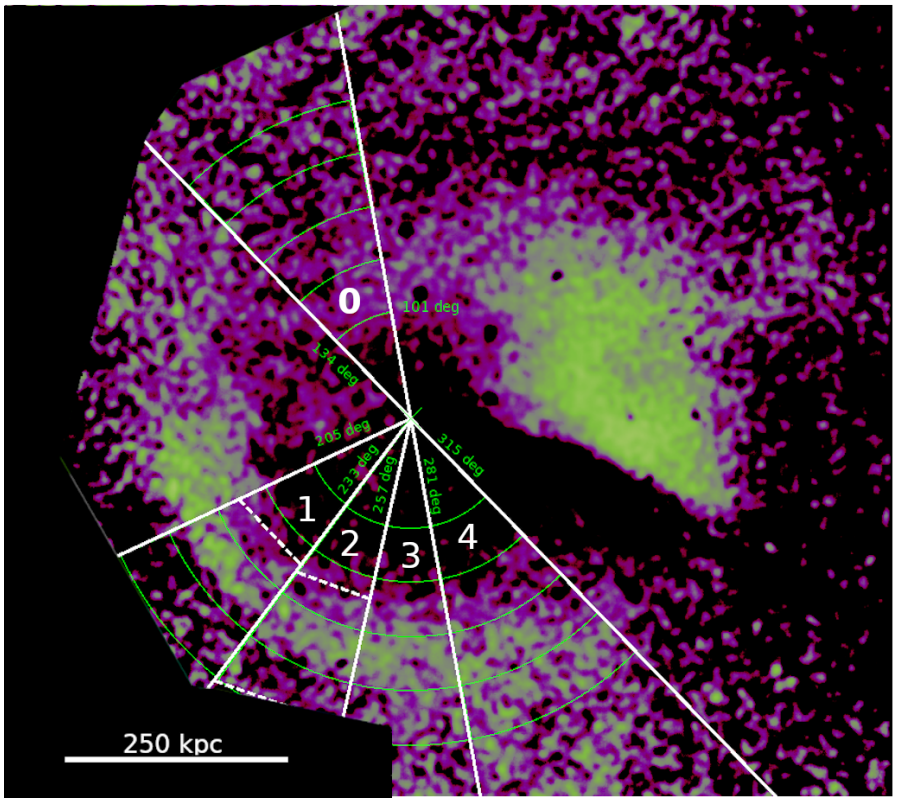
Pressure: $P = n_e k_B T$

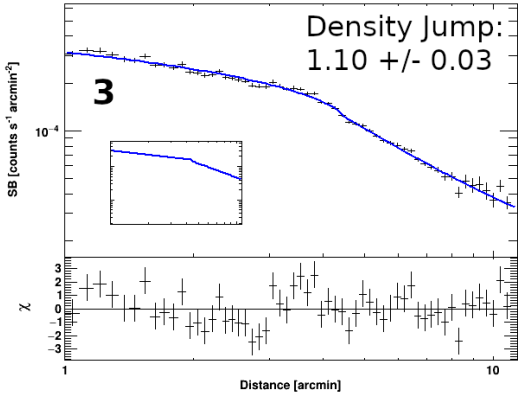
Entropy: $K = k_B T n_e^{-2/3}$

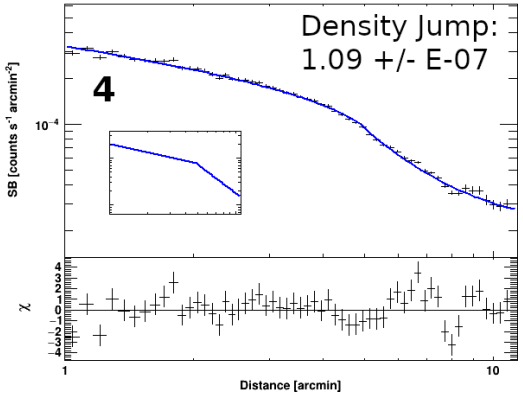
The Tail Feature



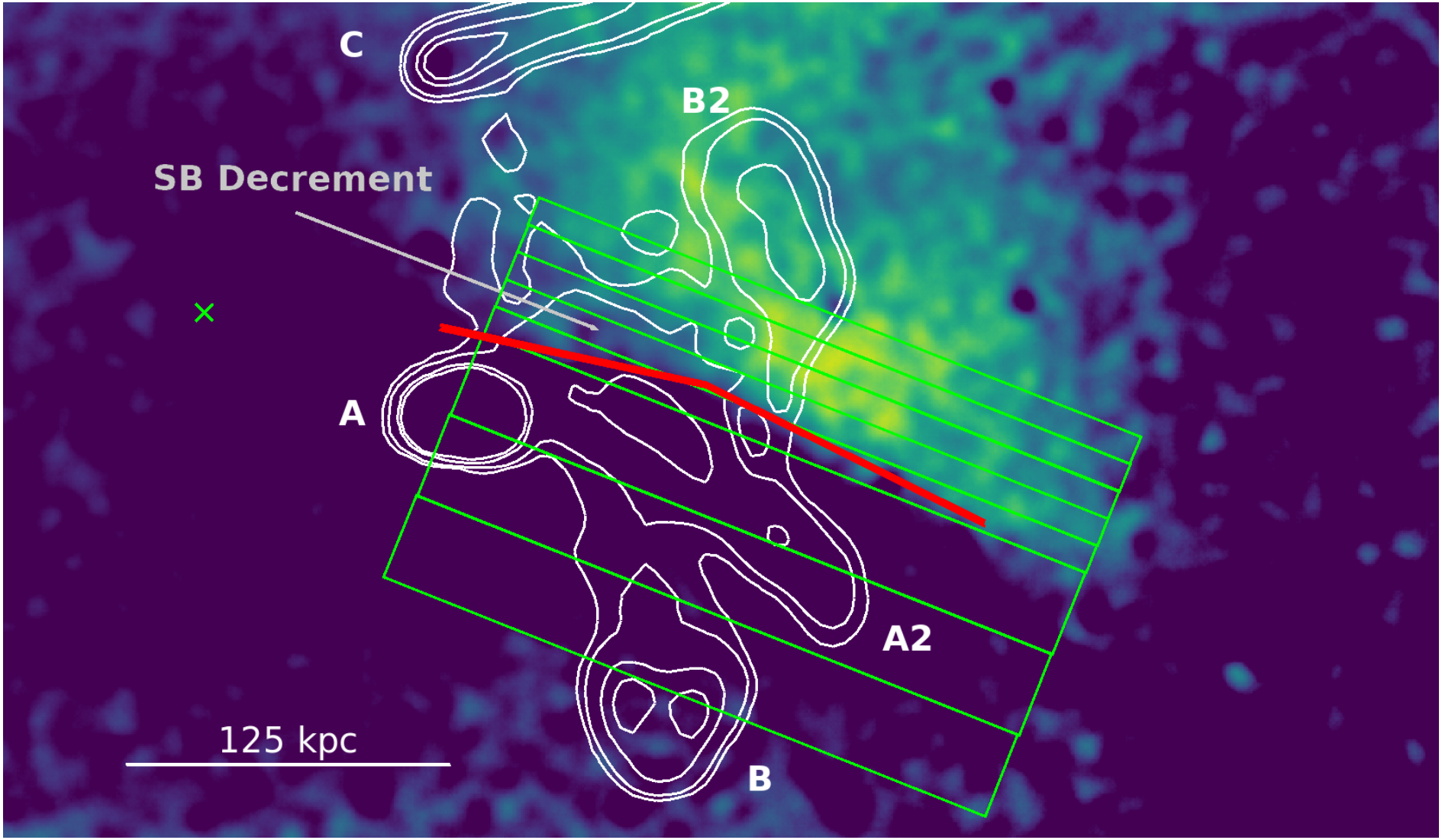




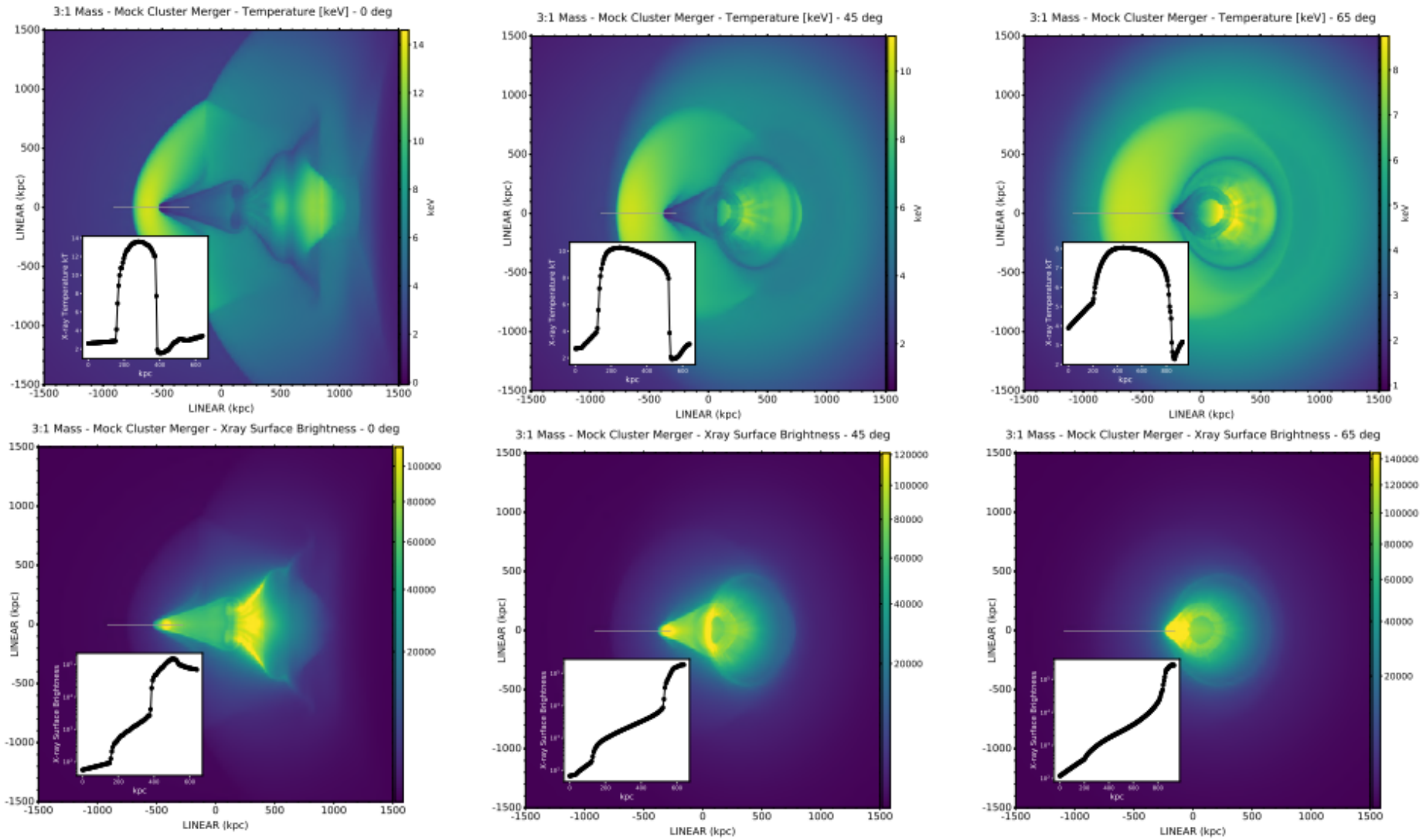




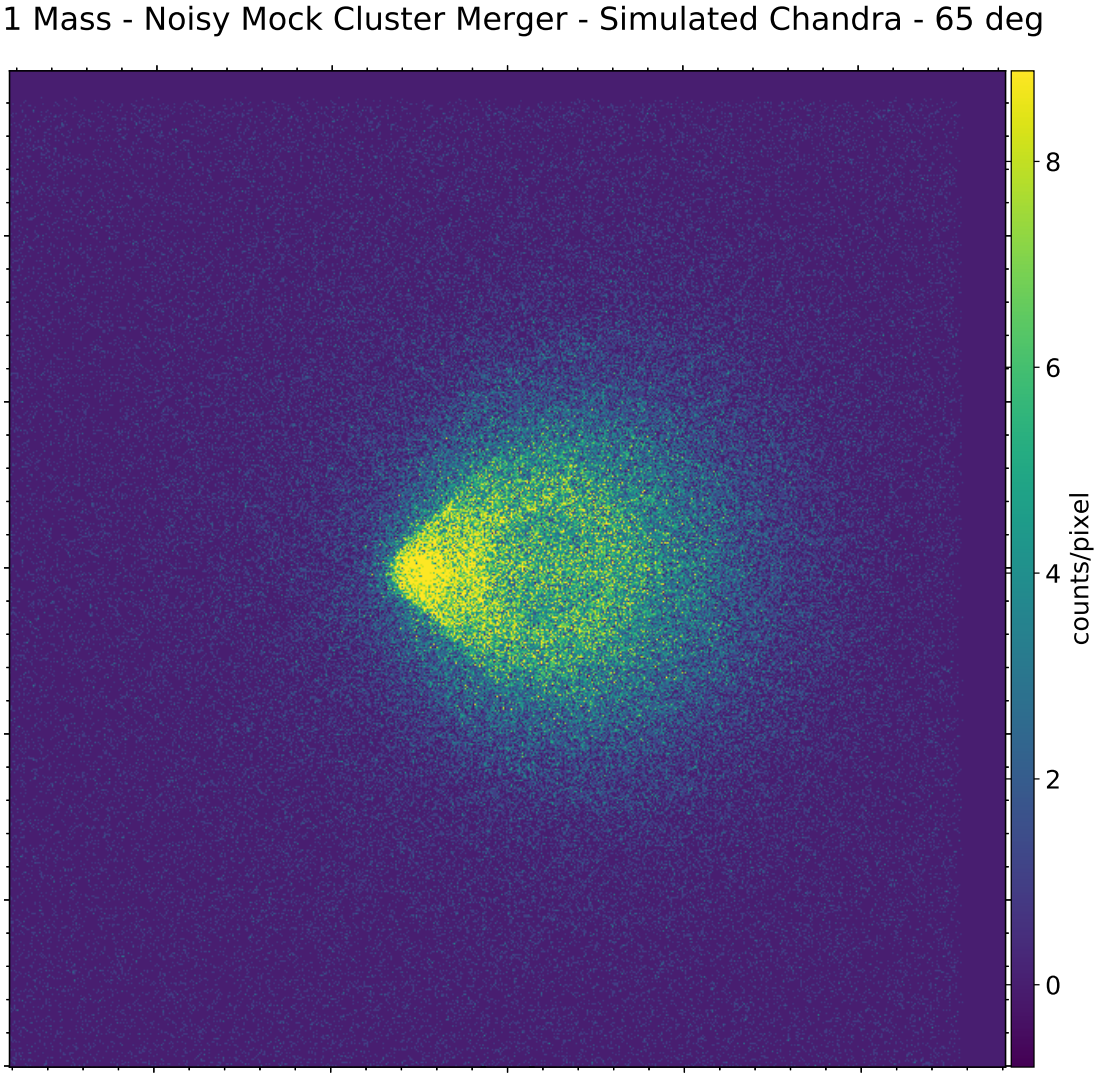
Diffusive Suppression at the Mouth



Simulated Temperature and Surface Brightness



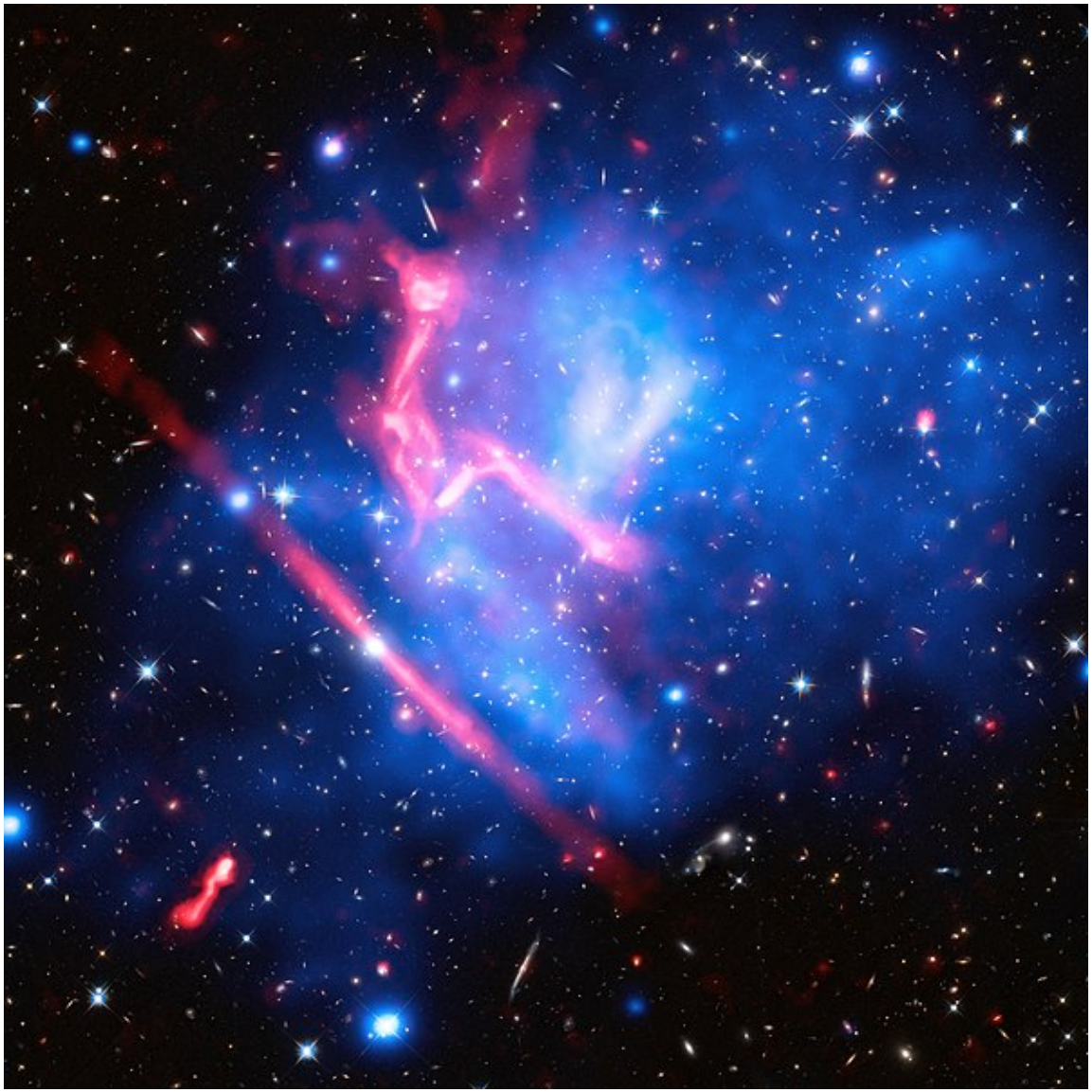
Simulated Chandra



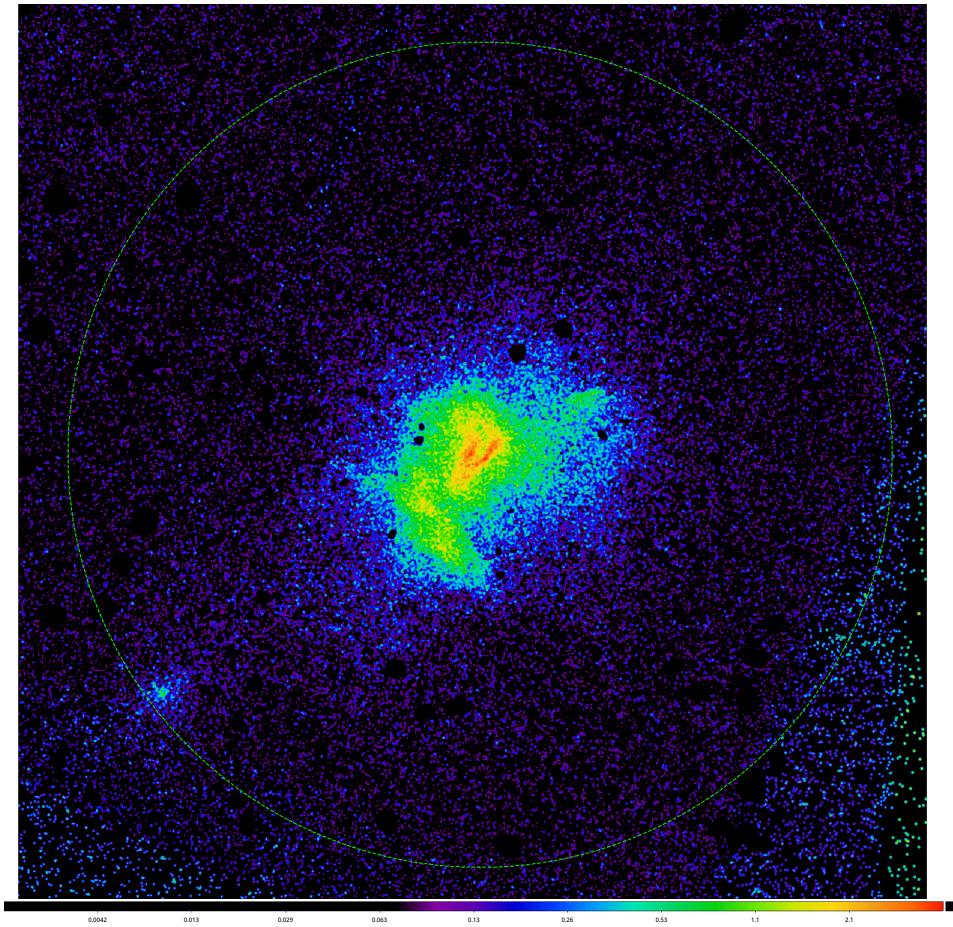
Section 2

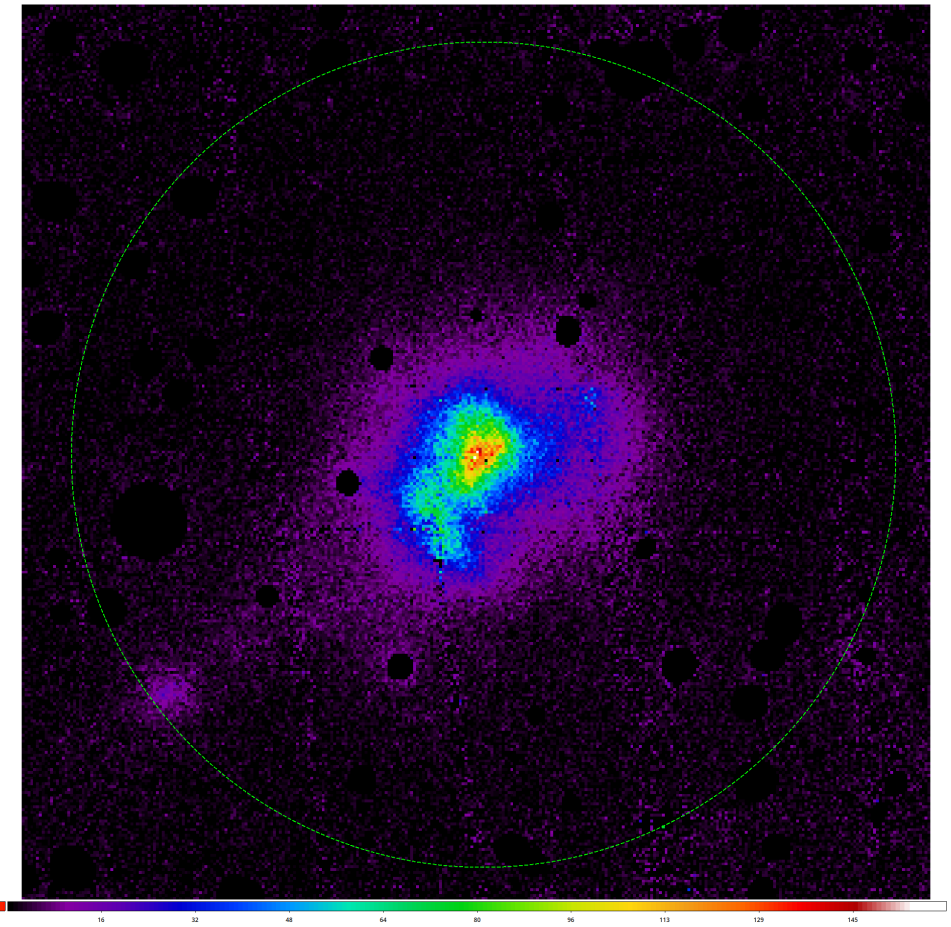
Exploring the Filament in MACSJ0717.5+3745

MACSJ0717.5+3745

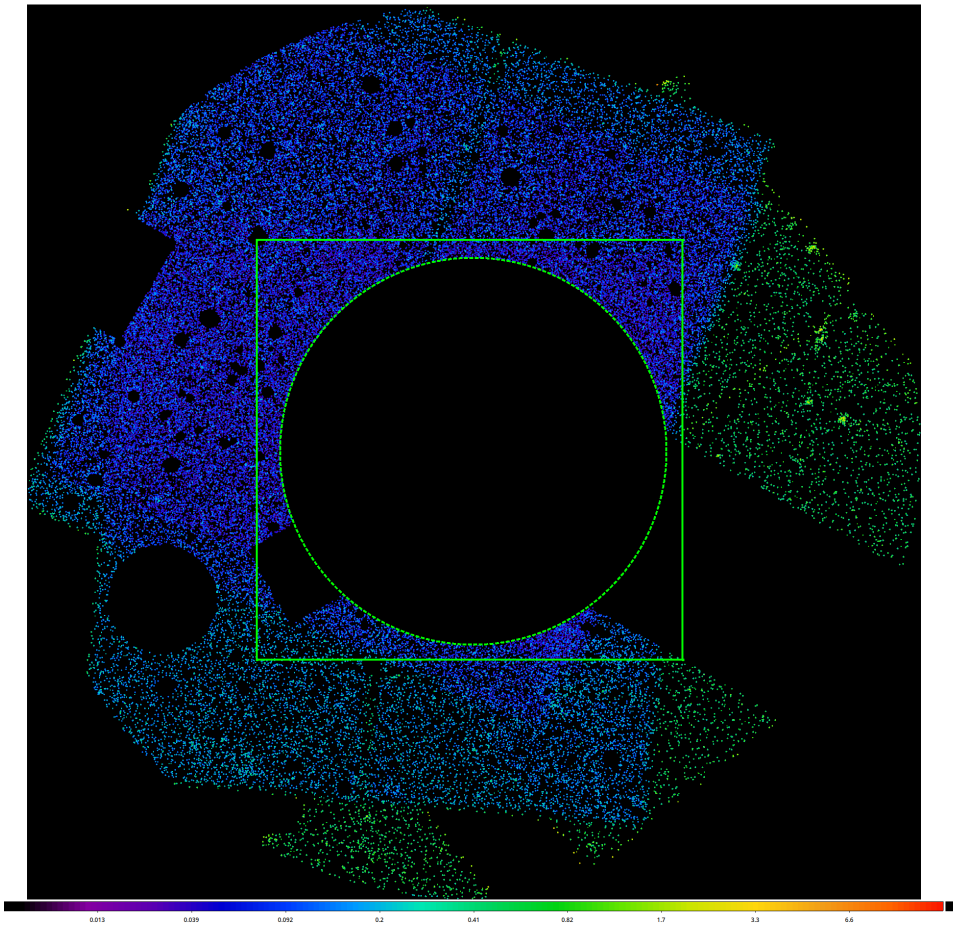


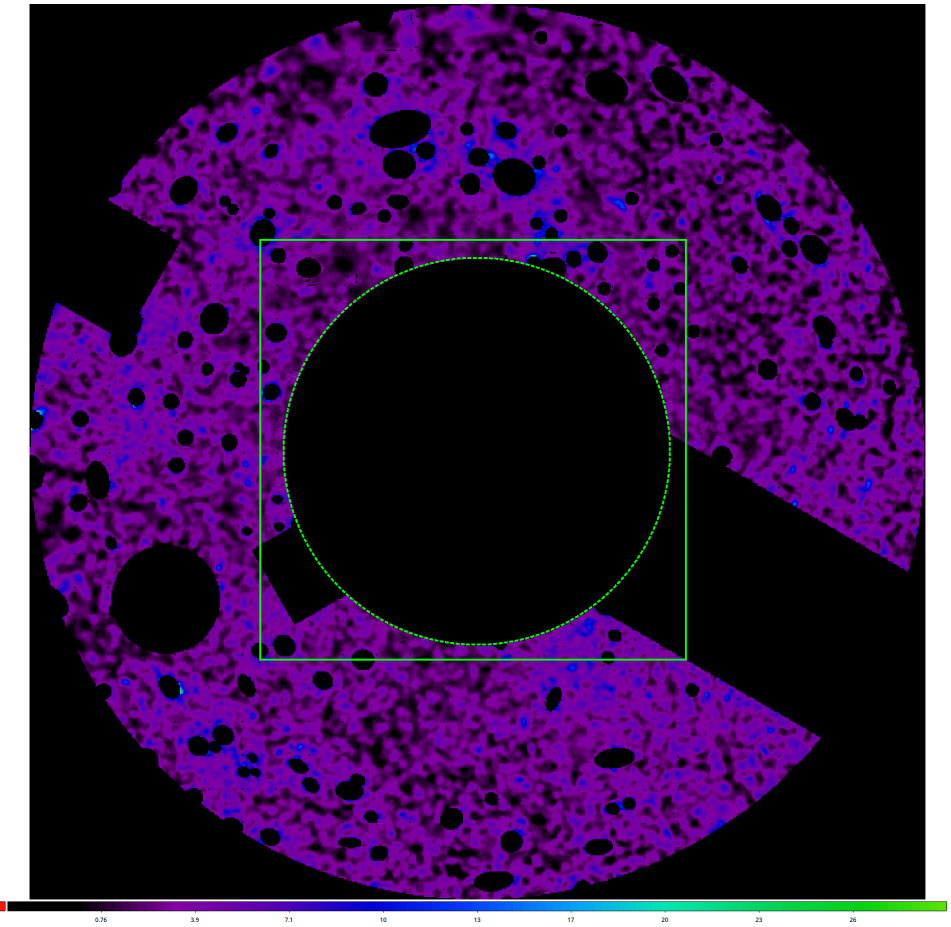
Cluster R200





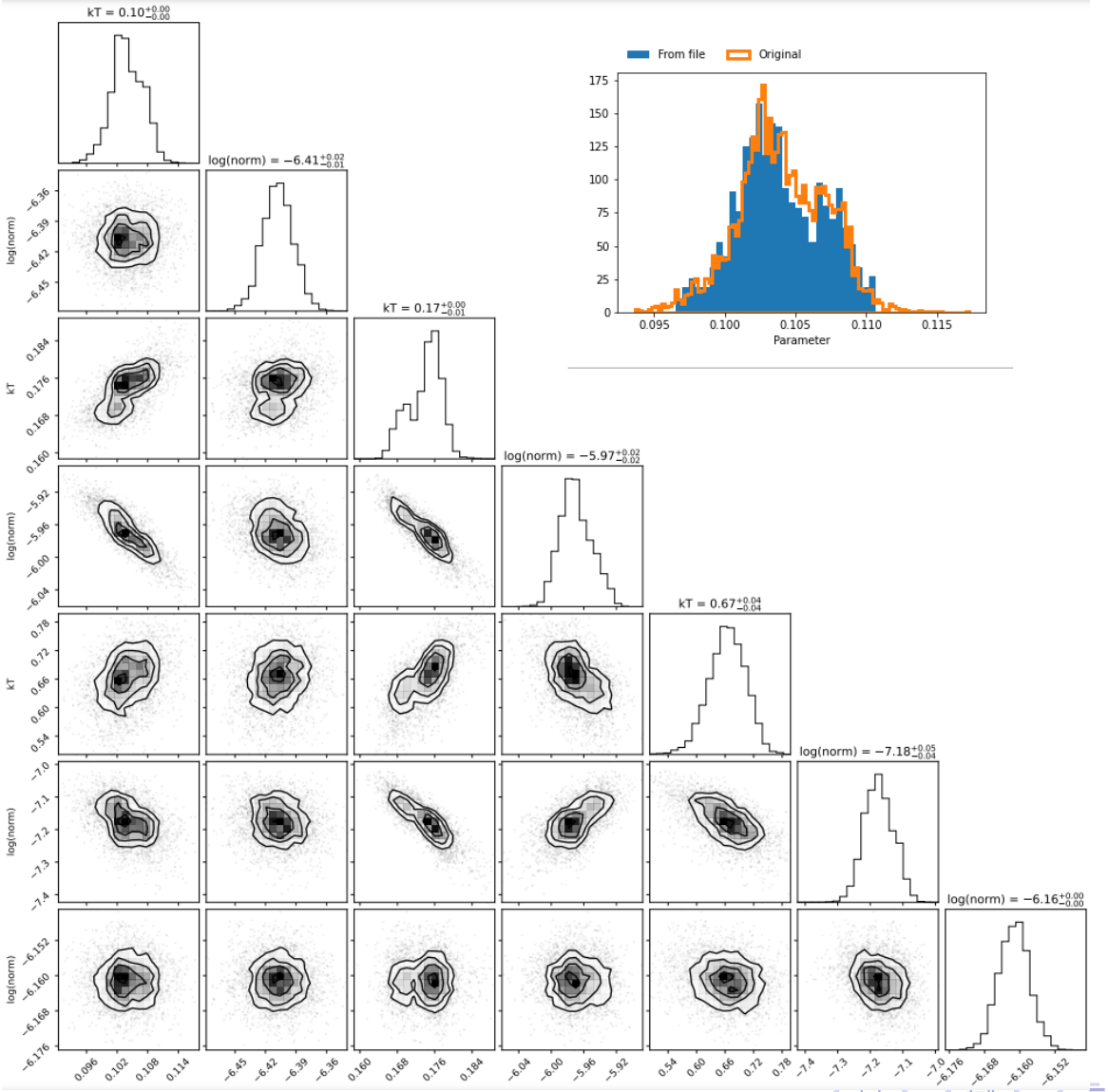
CXB Region





Fitting with BXA - Step 1: CXB

MODEL = APEC + PHABS(APEC + APEC + POW)



Section 3

Some Athena Stuff

Working Group

Athena charged particle diverter simulations: effects of micro-roughness on proton scattering using Geant4

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[g]INAF/Istituto di Astrofisica Spaziale e Fisica cosmica, Milan, Italy
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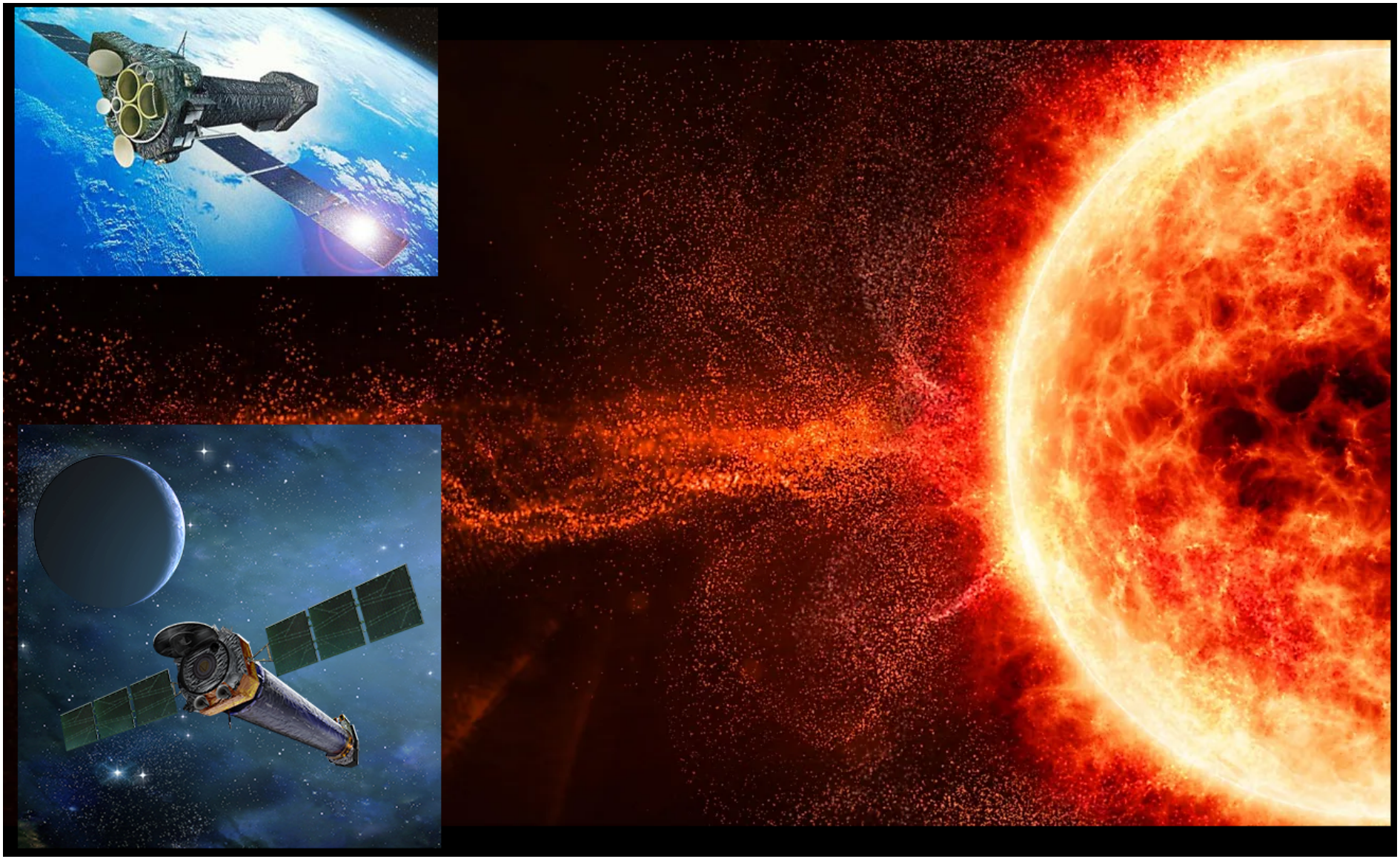
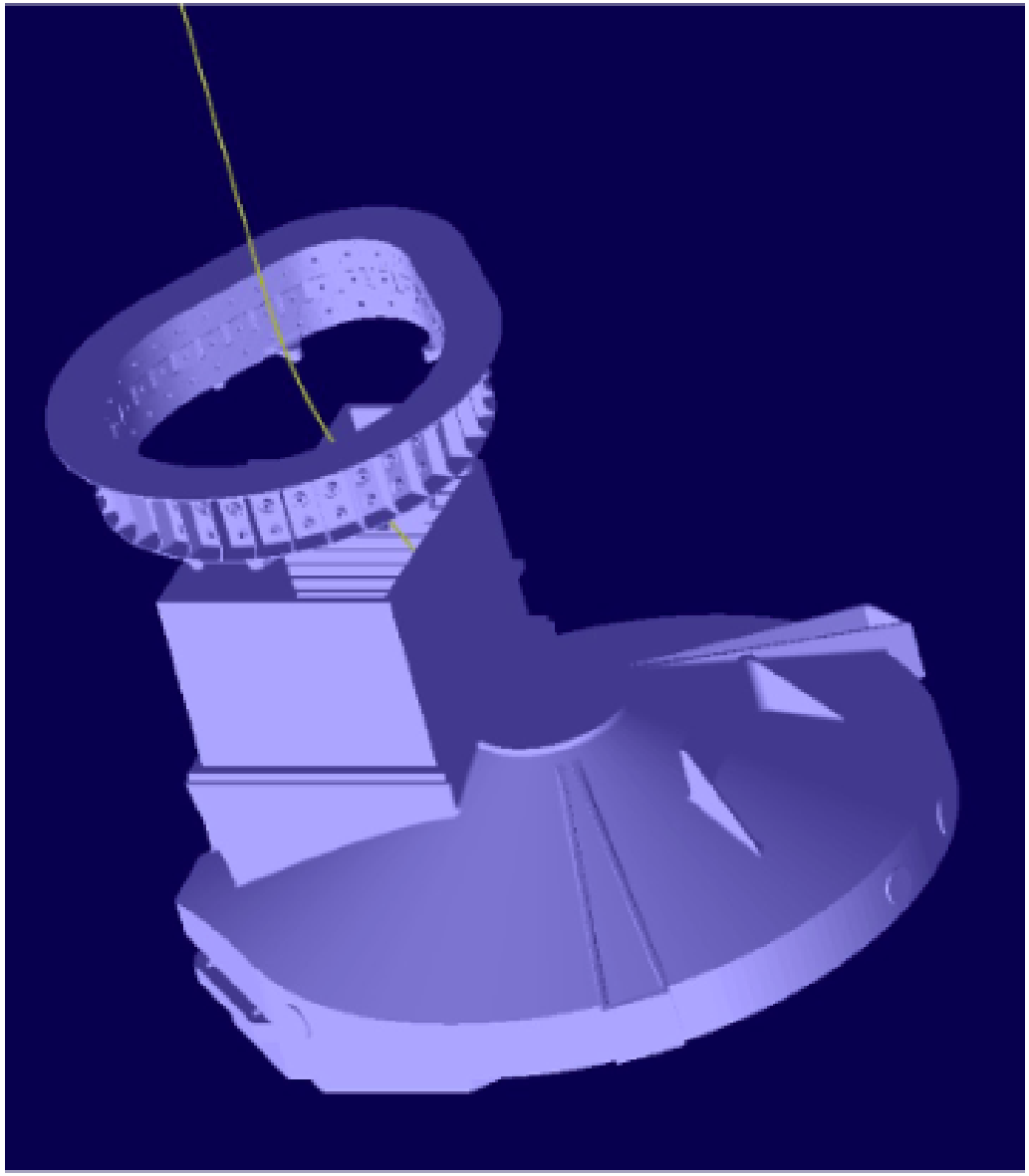
[i]INAF/Istituto di Astrofisica Spaziale e Fisica cosmica, Palermo, Italy
[j]Eberhard Karls University, Tübingen, Germany

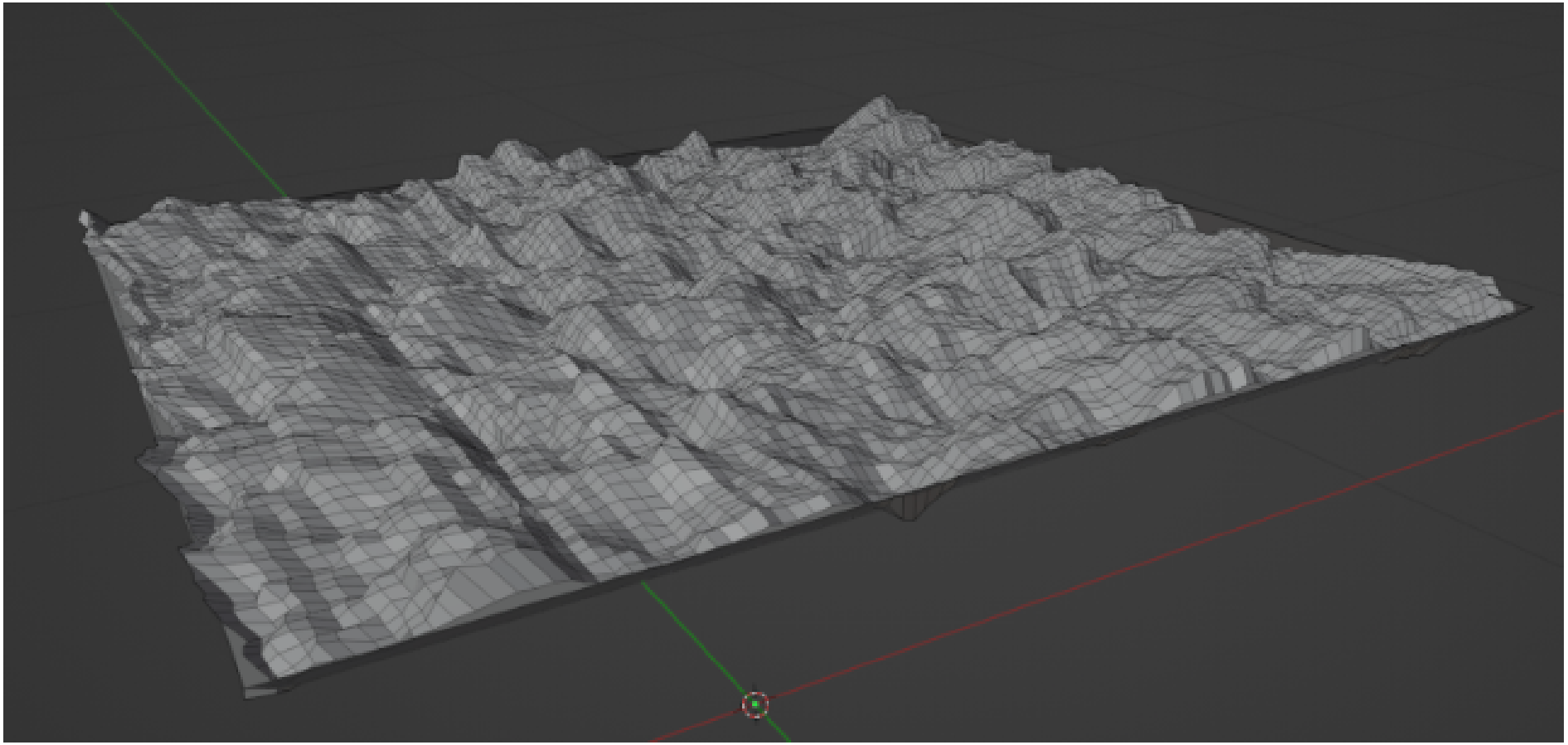
The problem



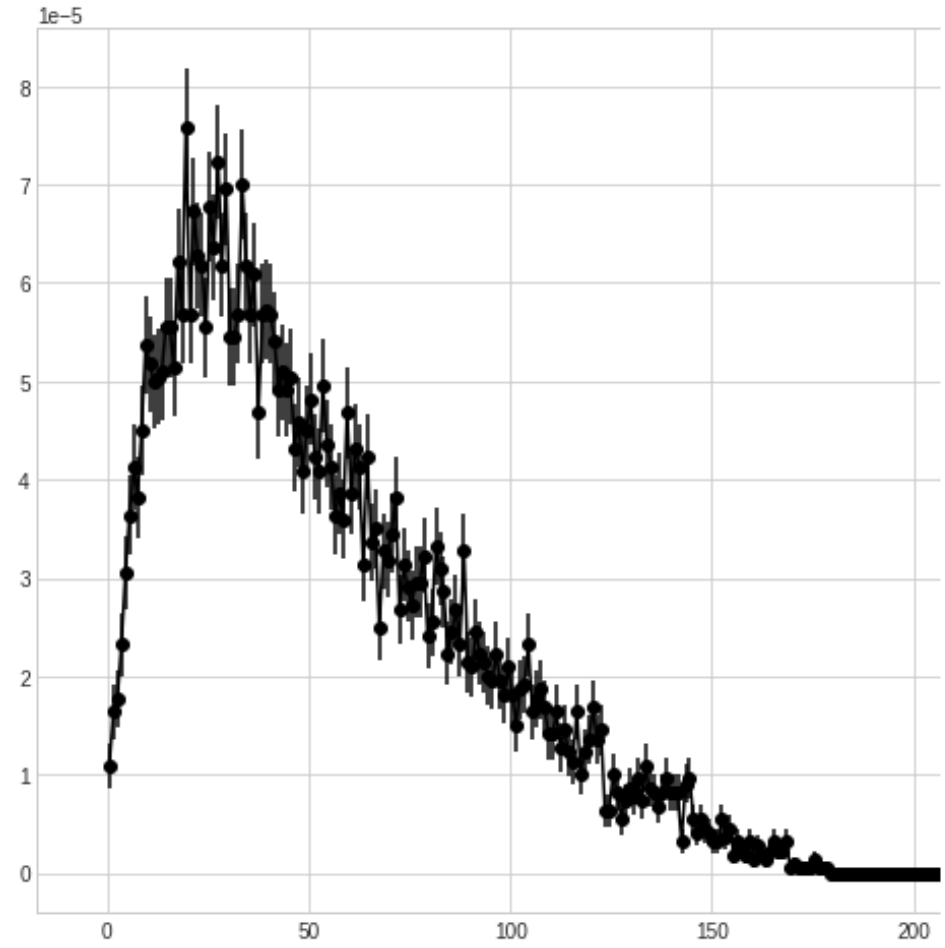
Geant4 Simulations of scattering

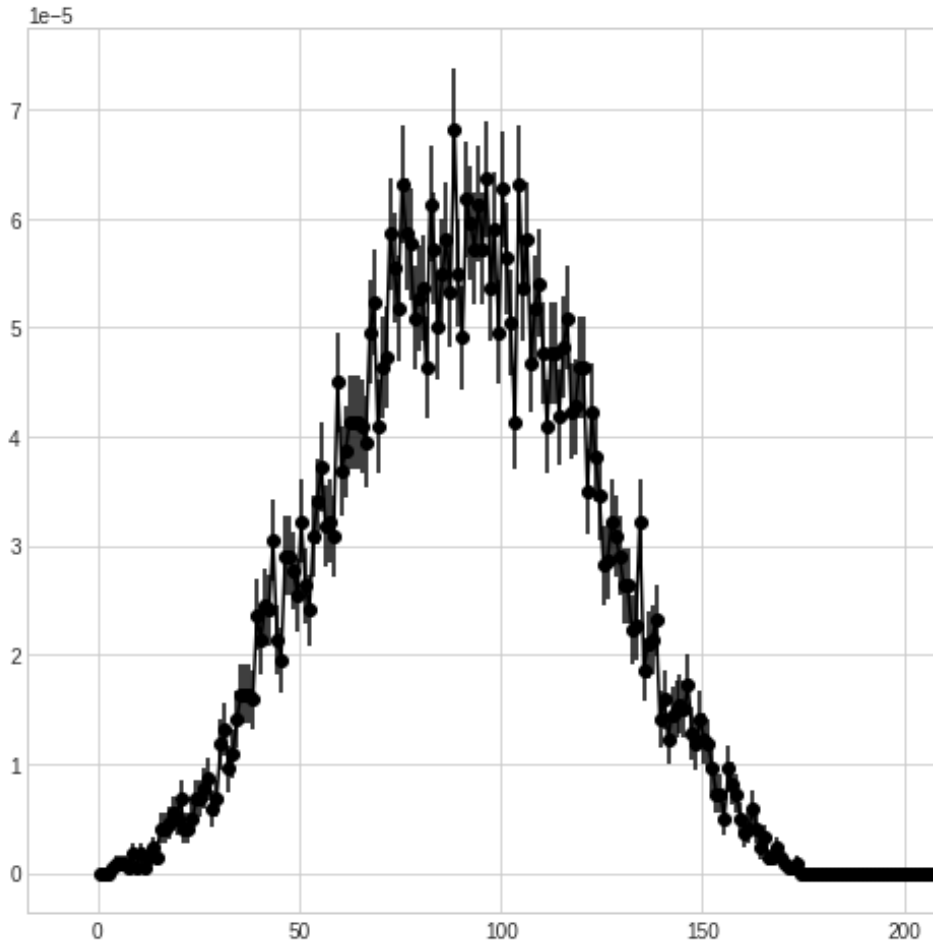


Effect of Surface Roughness on Proton Scattering

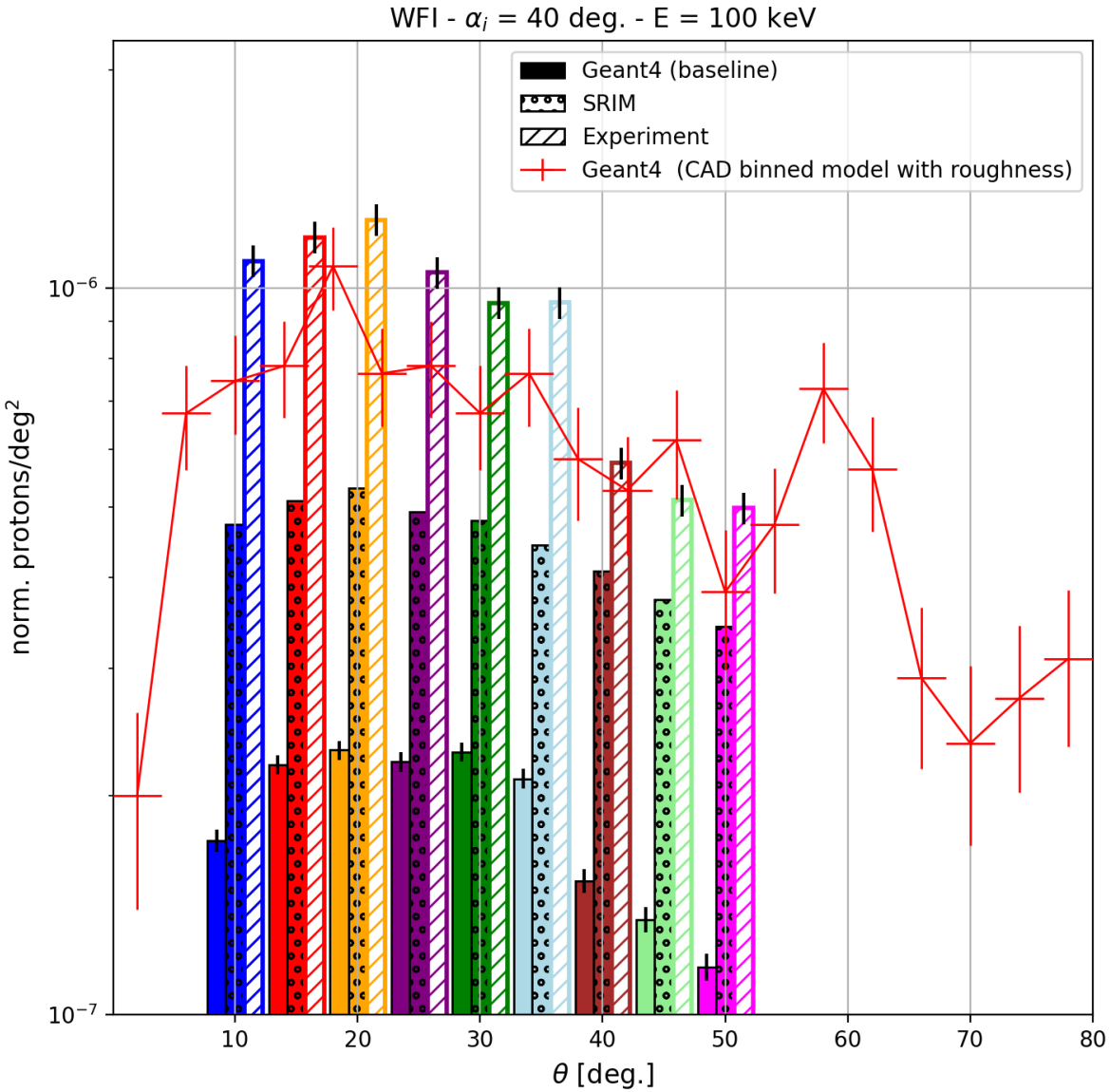


Histogram from 40deg incidence, 100 keV protons





Simulation Validation (New Results, as of yesterday)



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