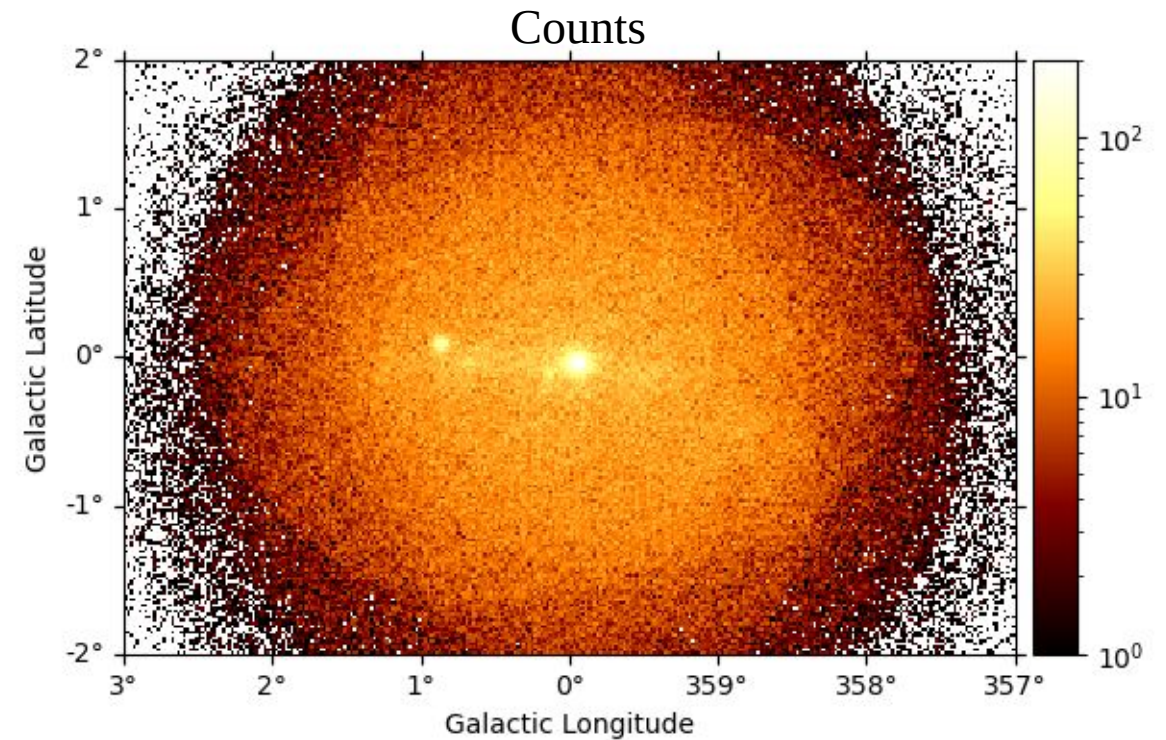


Dark Matter Signals and Diffuse Emission in the Galactic Centre Region with H.E.S.S.

Katrin Streil
Clarissa Martins Siqueira
Christopher van Eldik

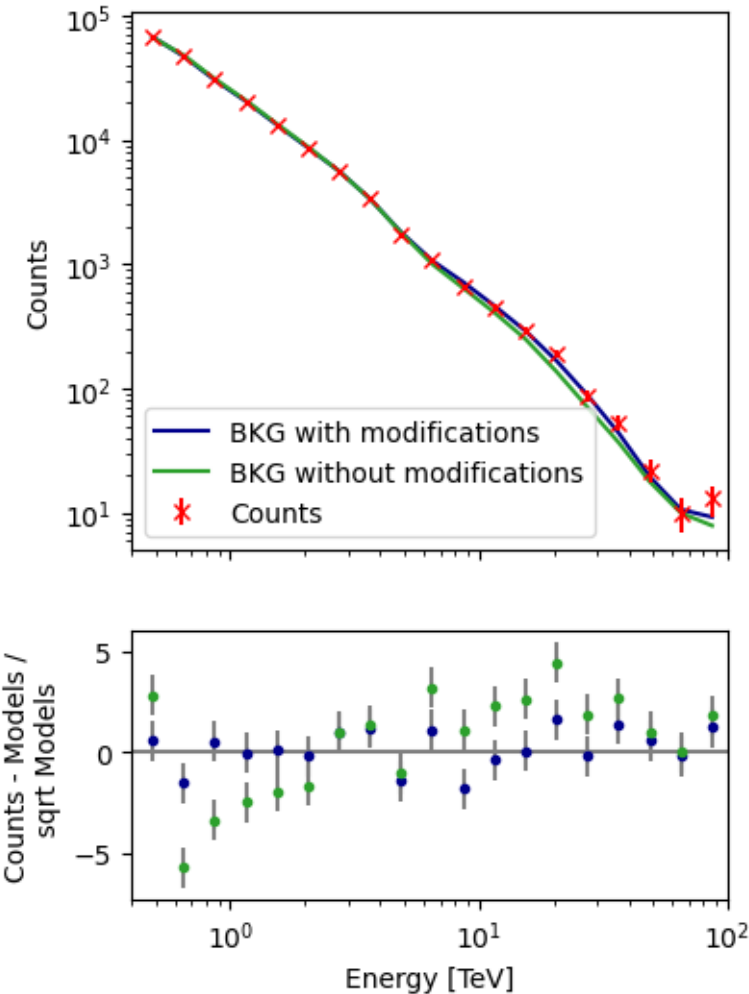
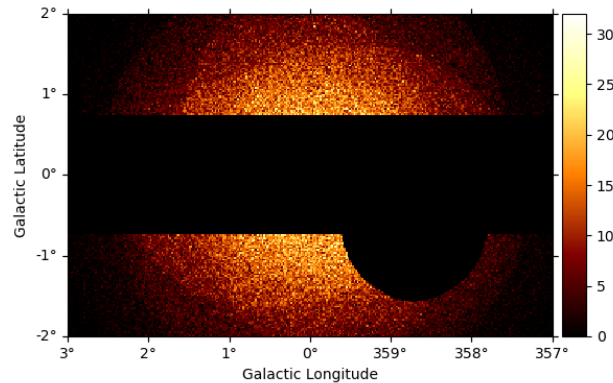
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hadronic background



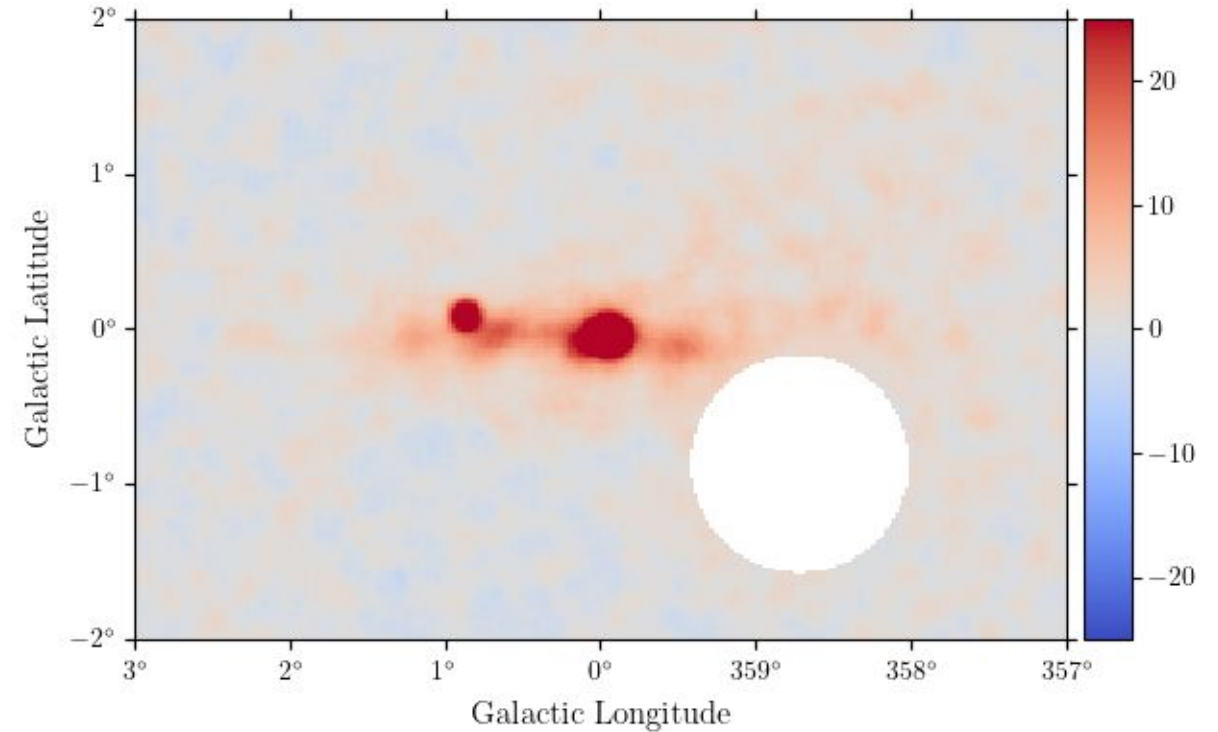
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hadronic background (additional binwise modifications)



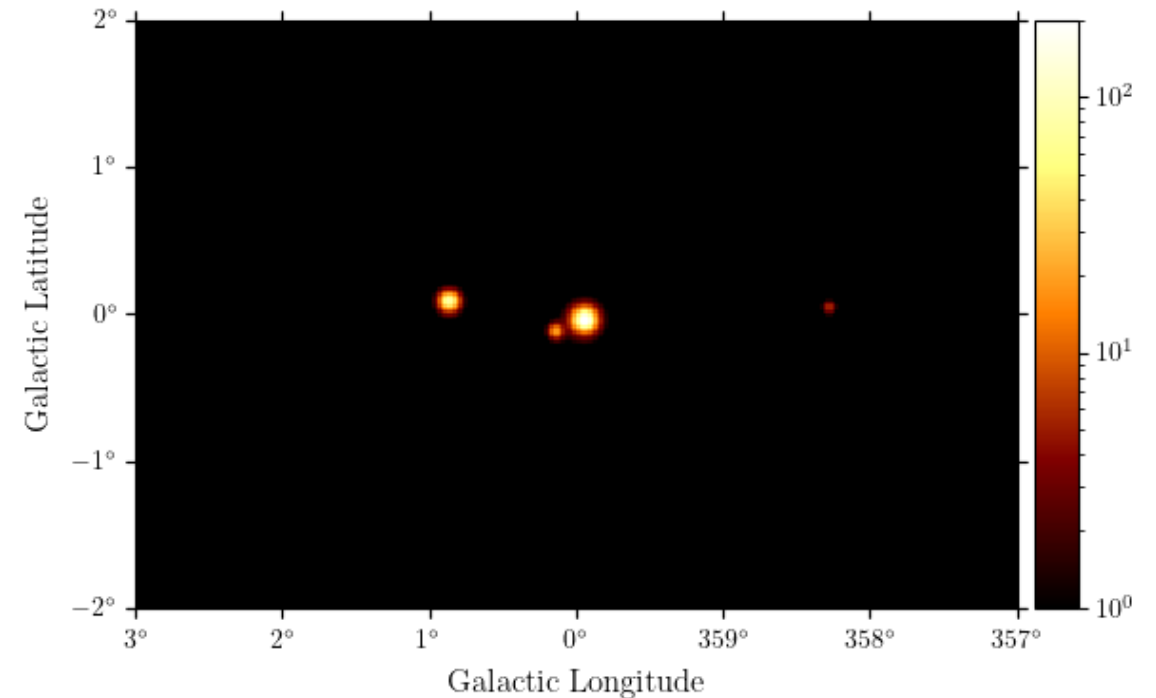
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hardonic background (additional binwise modifications)



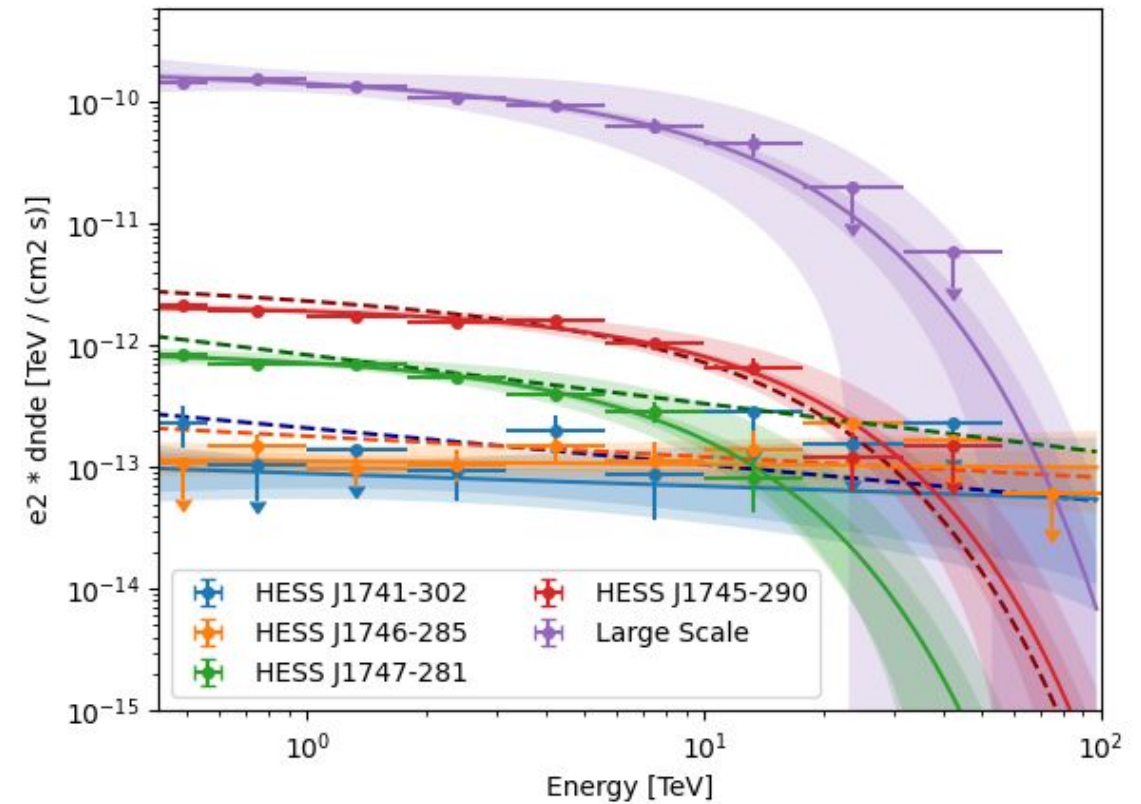
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hardonic background (additional binwise modifications)
 - Four point-sources with power-law (with exponential cutoff) spectra



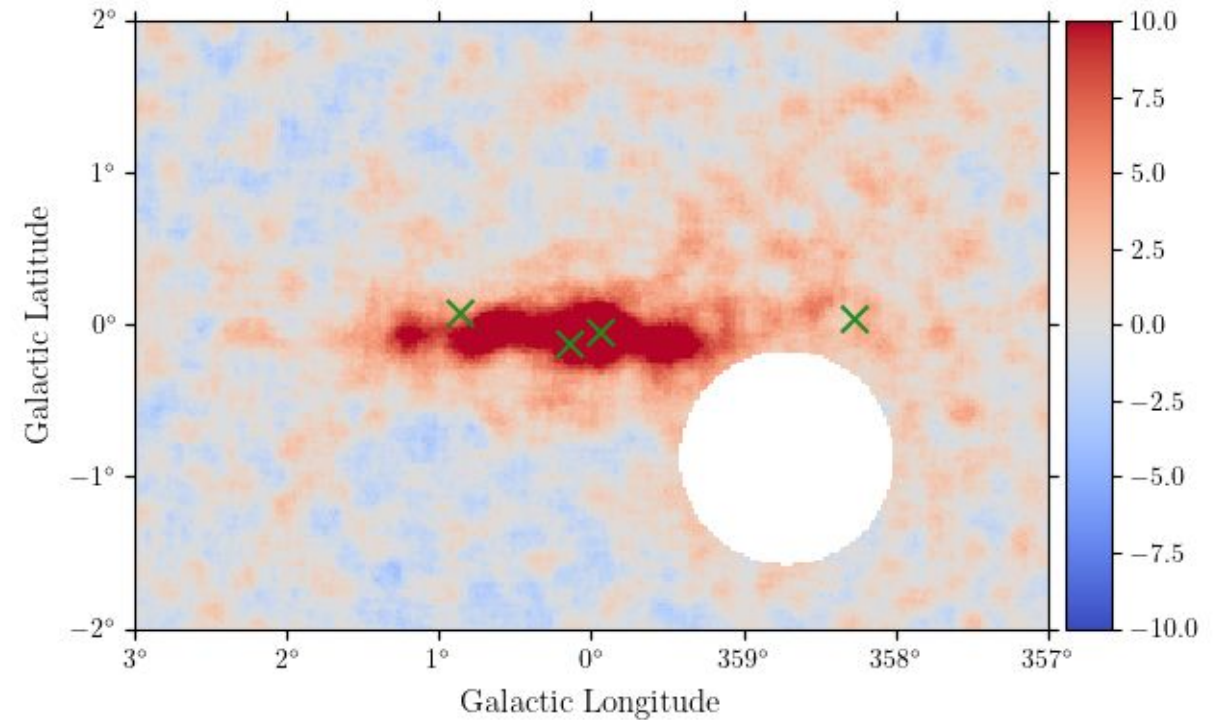
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hardonic background (additional binwise modifications)
 - Four point-sources with power-law (with exponential cutoff) spectra



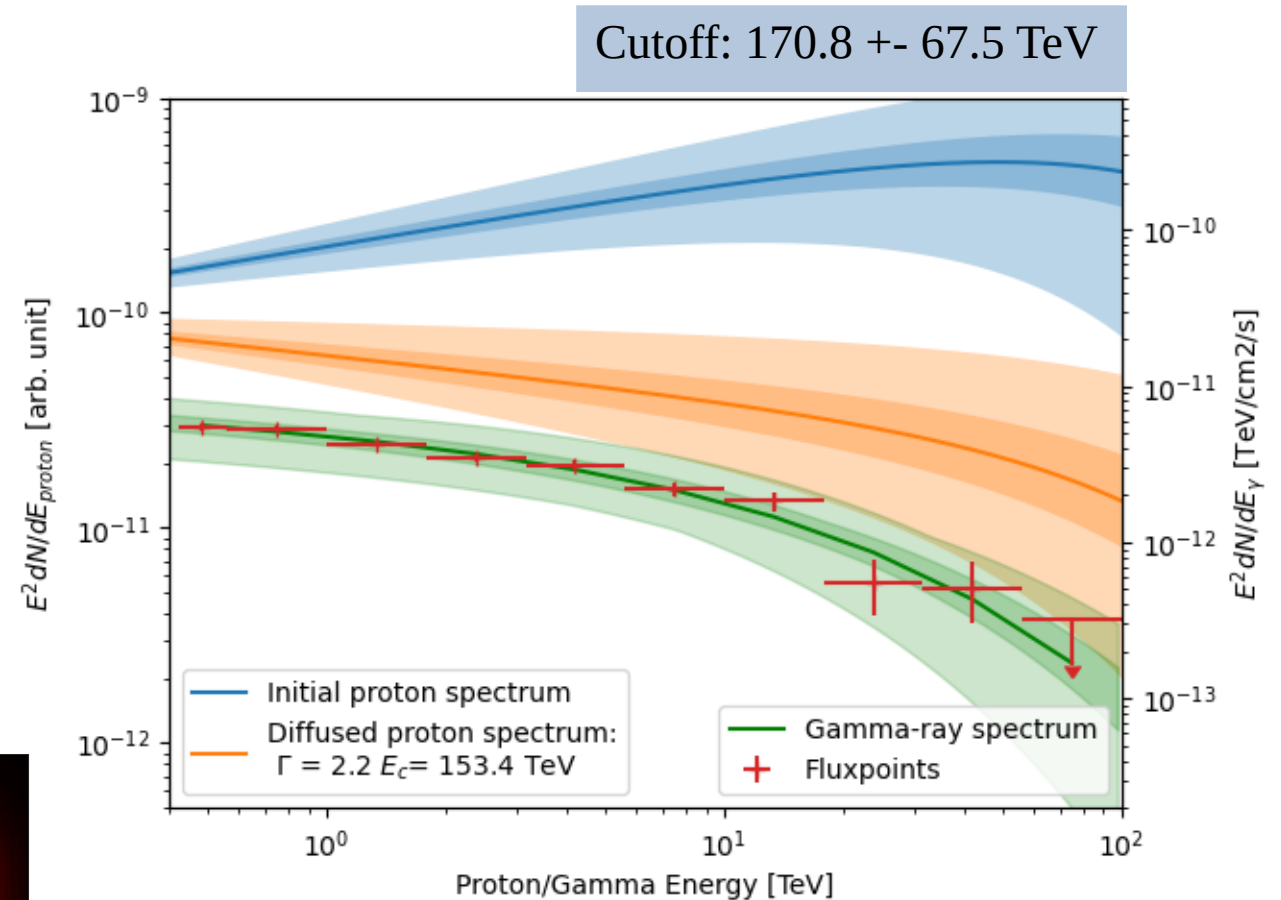
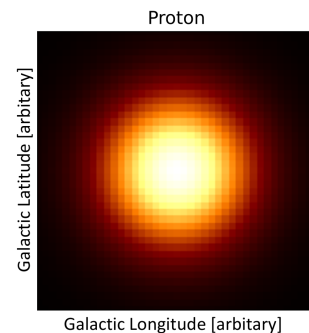
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hardonic background (additional binwise modifications)
 - Four point-sources with power-law (with exponential cutoff) spectra



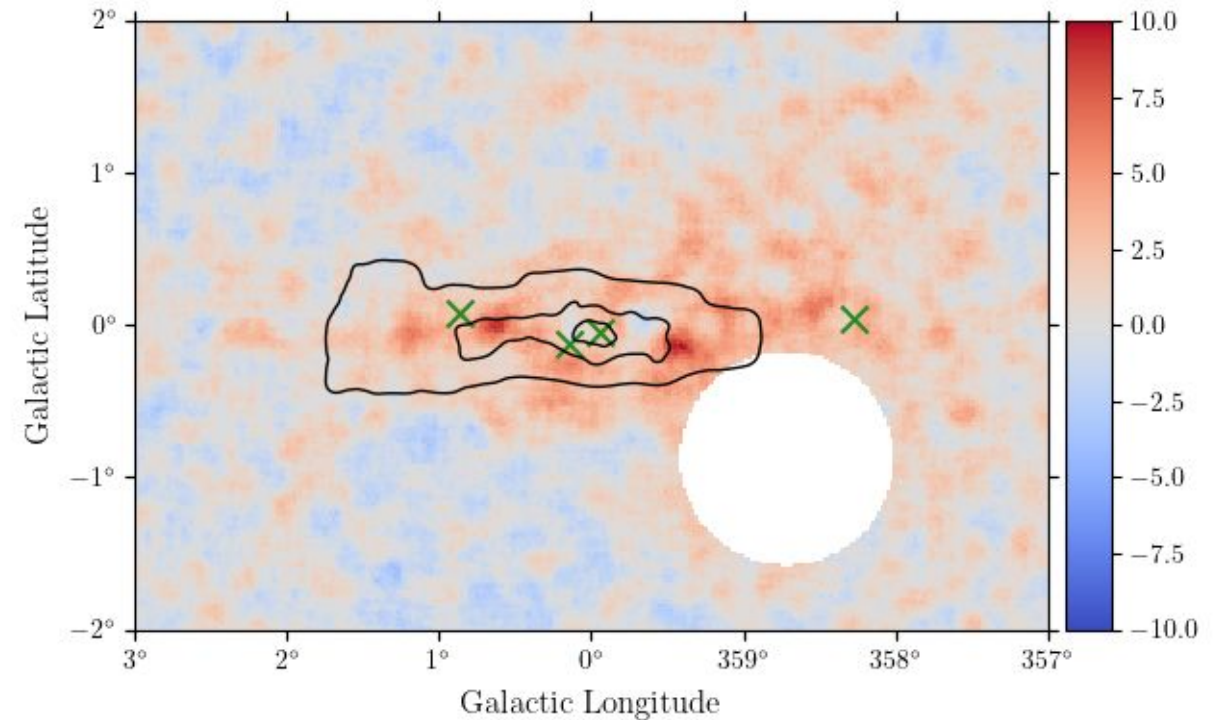
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hardonic background (additional binwise modifications)
 - Four point-sources with power-law (with exponential cutoff) spectra
 - Diffuse emission:
 - Point-like source at Sgr A* emitting protons with a power-law spectrum + exp. Cutoff
 - Protons are modeled to diffuse
 - Interaction with the gas
 - Gamma-ray emission



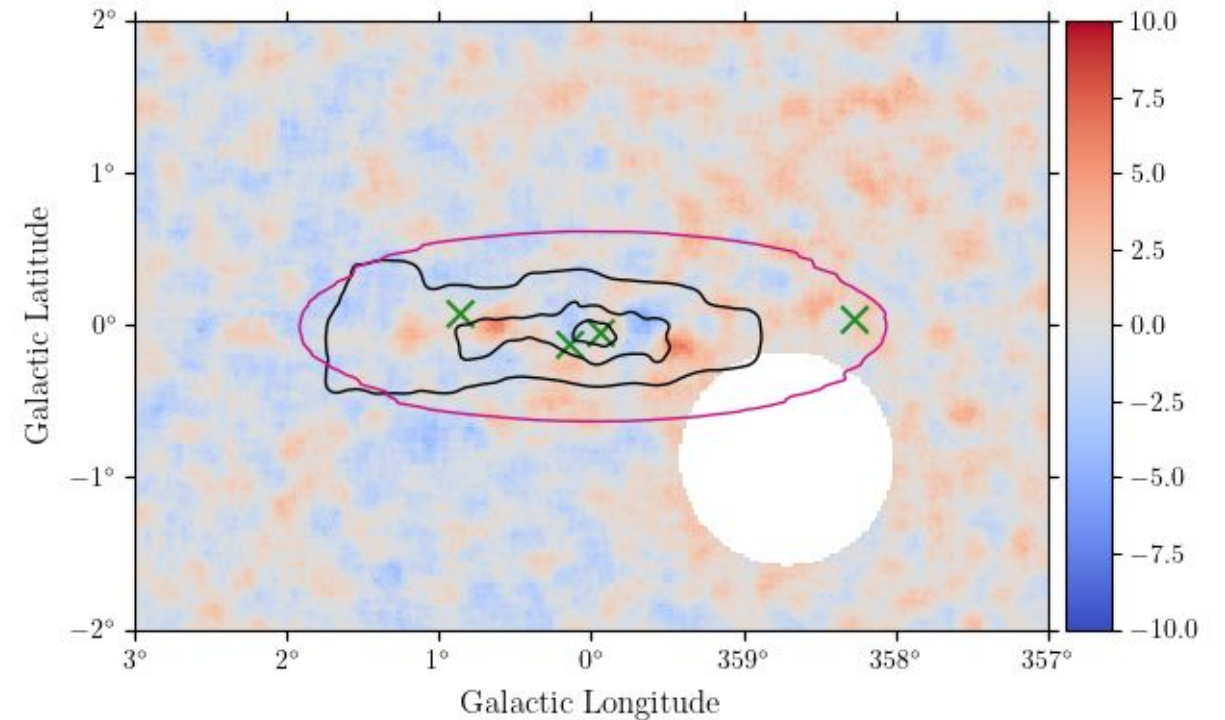
Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hardonic background (additional binwise modifications)
 - Four point-sources with power-law (with exponential cutoff) spectra
 - Diffuse emission:
 - Point-like source at Sgr A* emitting protons with a power-law spectrum + exp. Cutoff
 - Protons are modeled to diffuse
 - Interaction with the gas
 - Gamma-ray emission

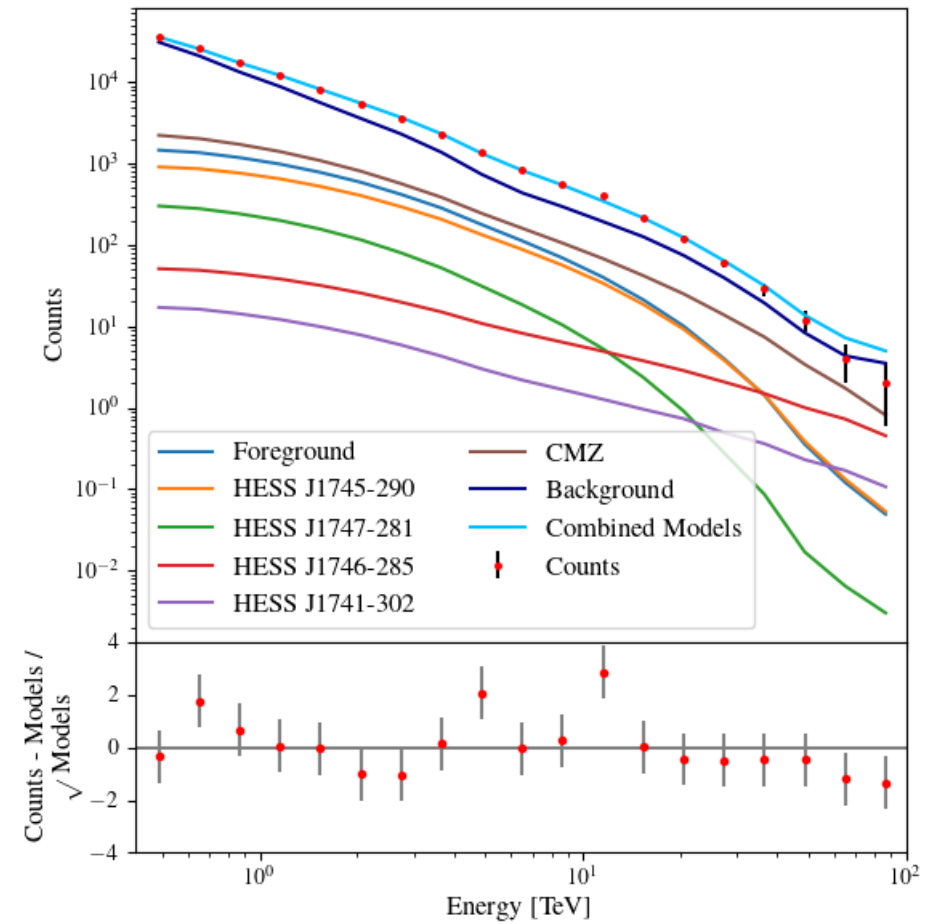
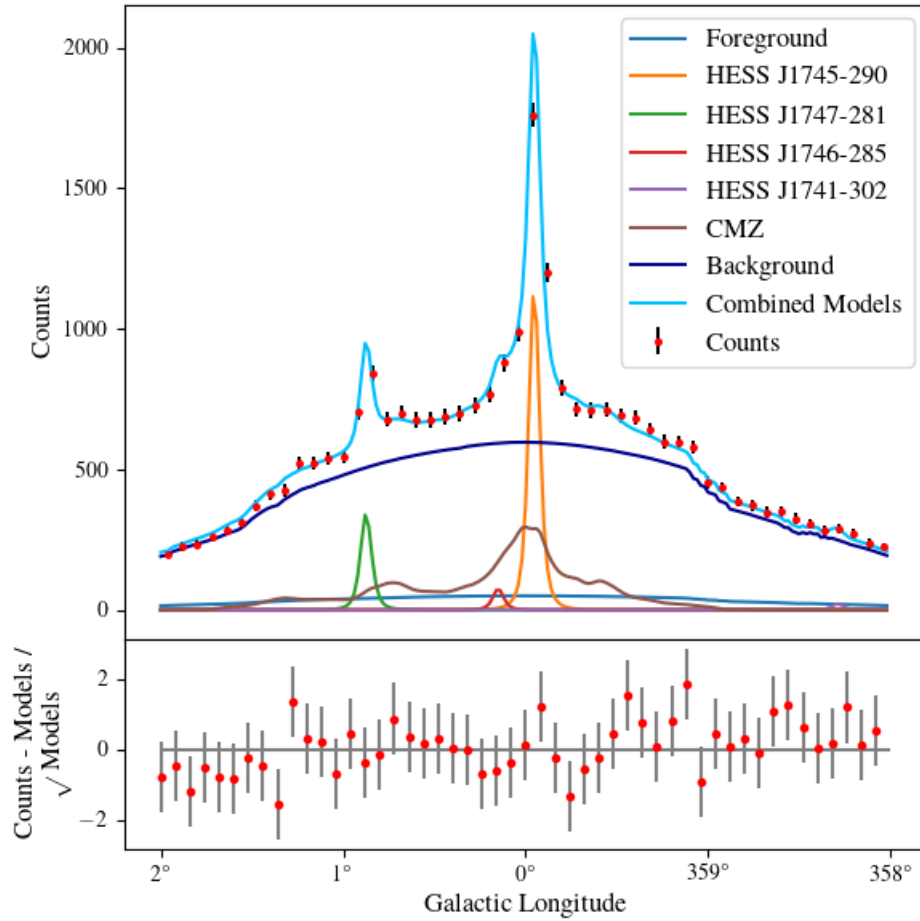


Galactic Centre with H.E.S.S.

- H.E.S.S. I + II, Hap_HD std_ImPACT
- Analysis tool: Gammapy
- 3D cube: morphology + spectra
- Model components:
 - Template for hadronic background (additional binwise modifications)
 - Four point-sources with power-law (with exponential cutoff) spectra
 - Diffuse emission:
 - Point-like source at Sgr A* emitting protons with a power-law spectrum + exp. Cutoff
 - Protons are modeled to diffuse
 - Interaction with the gas
 - Gamma-ray emission
- Foreground emission

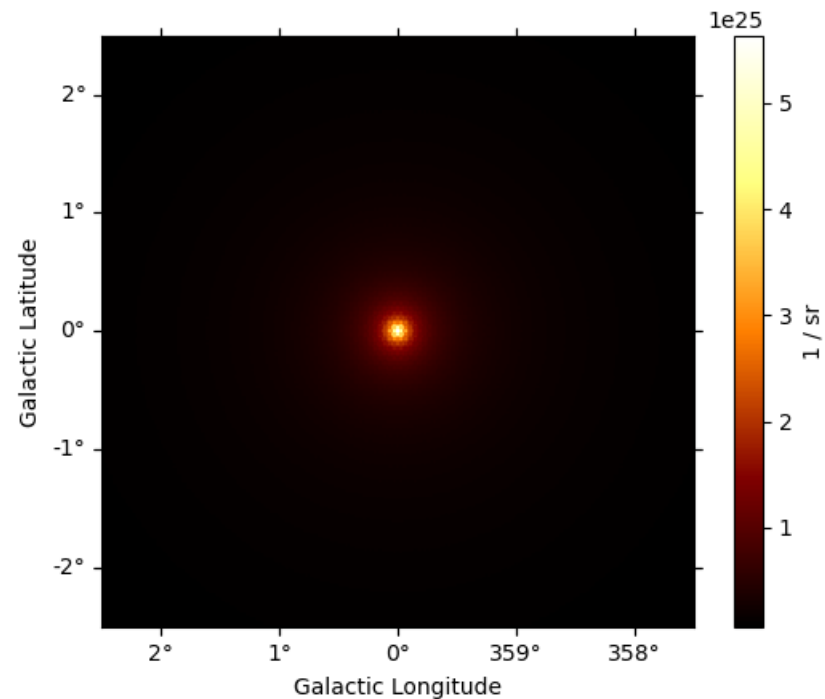
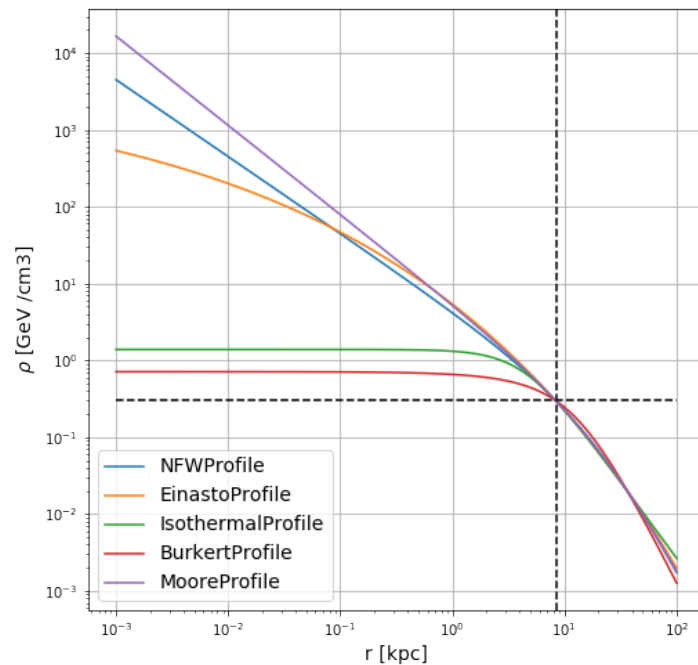


Galactic Centre with H.E.S.S.



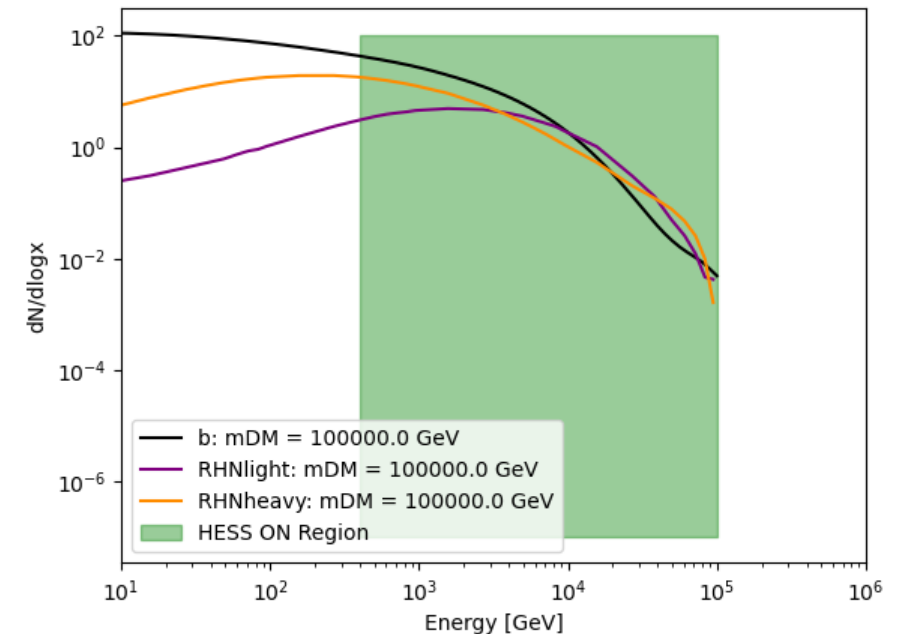
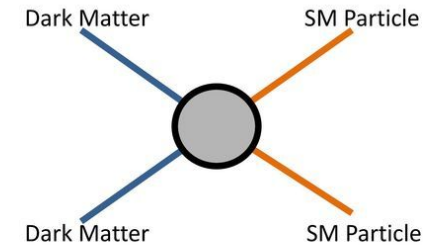
Dark Matter Annihilation Signals

- Building of a 3D model
- Morphology: J-Factor based on Einasto profile



Dark Matter Annihilation Signals

- Building of a 3D model
- Morphology: J-Factor based on Einasto profile
- Gamma-ray spectrum:
 - WIMPs: primary fluxes at the production point for different annihilation channels ($\bar{b}b$ channel)
 - Right handed neutrinos:
 - $\bar{\nu}$ heavy or light
- Differential flux of emitted photons \sim annihilation cross section
 - Setting UL on the DM annihilation cross section for different DM masses



WIMP Annihilation Signals for RHN

