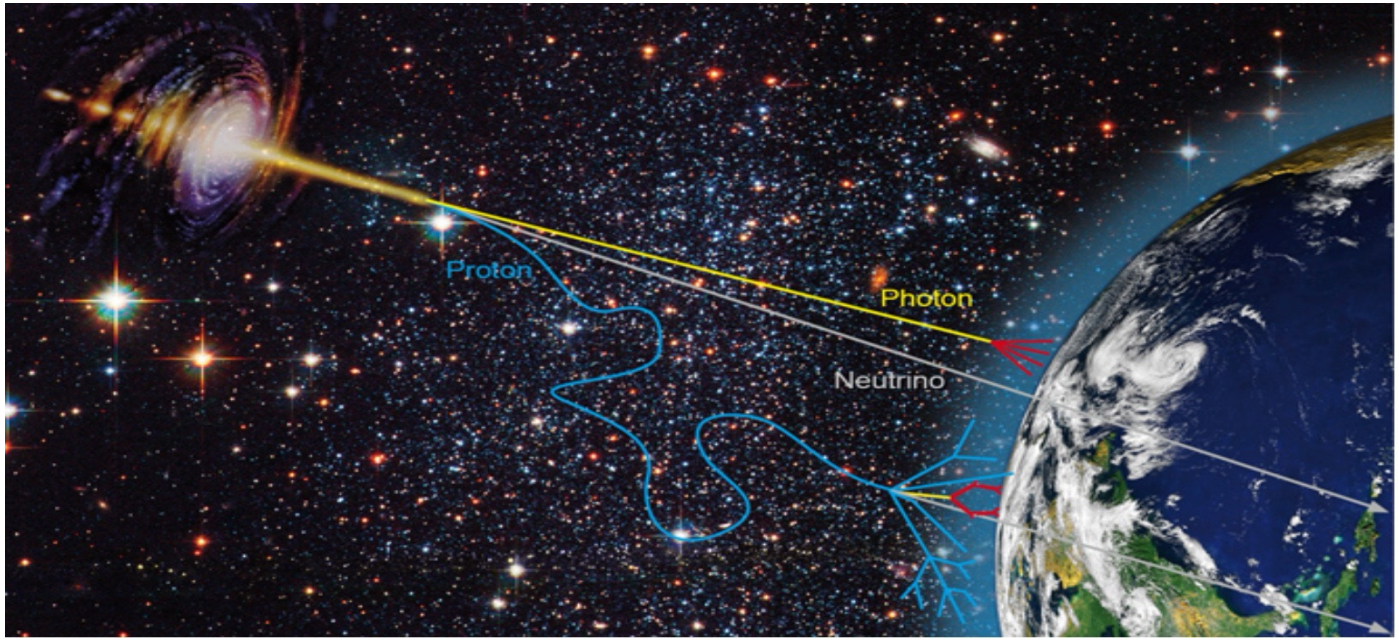
Updated Analysis of Central Galaxy (48< l < 62)

A step towards the second LHAASO catalog



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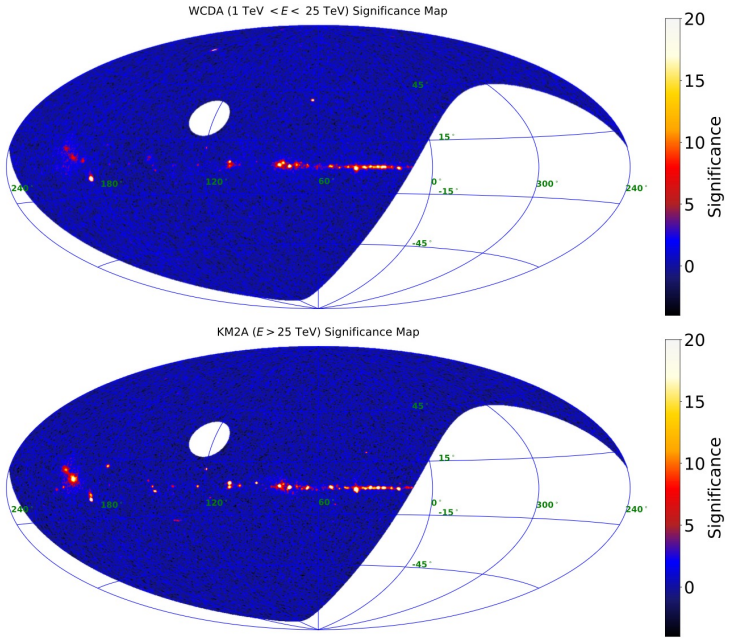
Introduction

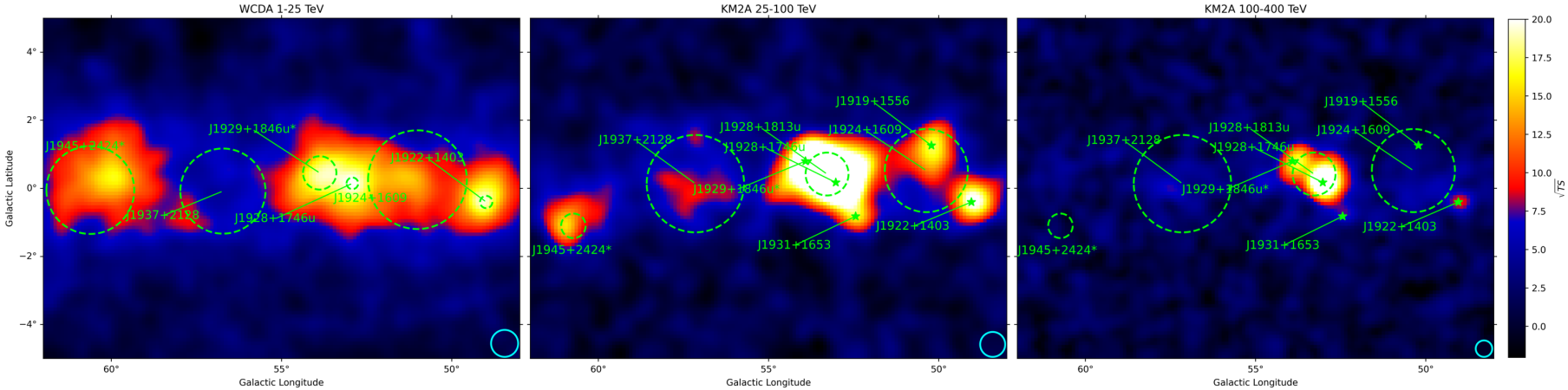
- The first γ-ray source catalog of the Large High Altitude Air Shower Observatory (LHAASO) reported 90 gamma-ray sources, 43 of them are ultra high energy sources.

- With an expanded dataset, we perform an updated analysis to demonstrate how increased statistics reveal changes in source morphology and resolve finer emission structures.



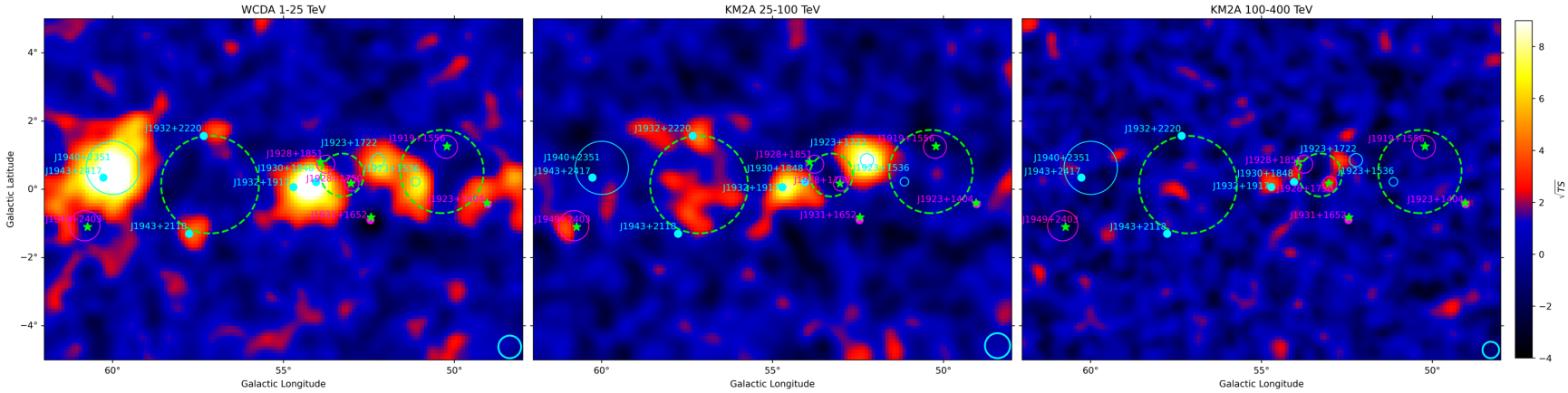
The First LHAASO Catalog of Gamma-Ray Sources. Astrophys. J. Suppl., 271(1):25, 2024

Skymap with 1LHAASO Sources



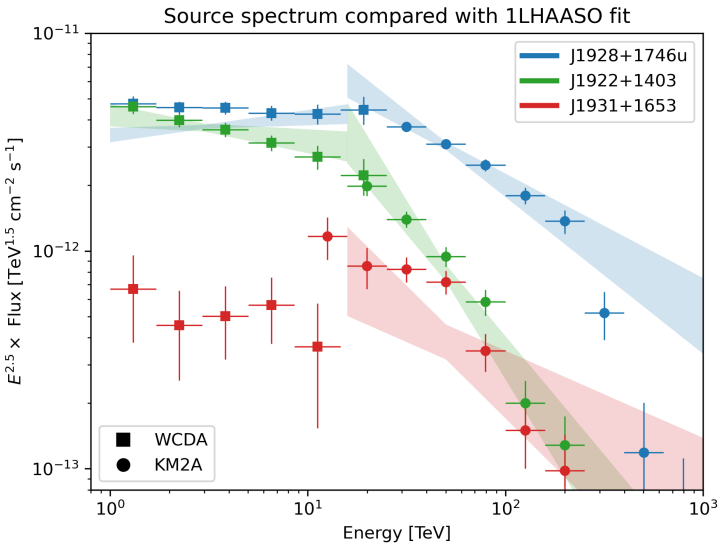
Intermediate Map

Lime dashed: position of 1LHAASO
Cyan solid: position of potential new sources
Magenta: Bright sources that are subtracted

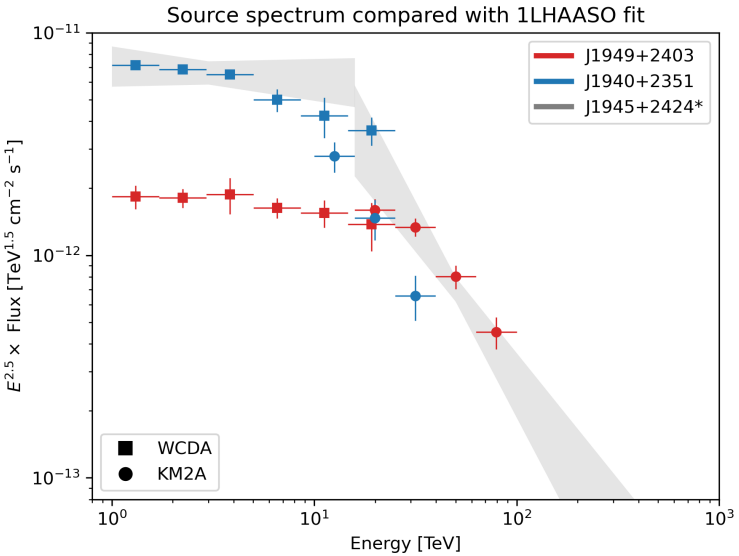


Spectrum of the Sources

Spectrum of bright sources stays the same



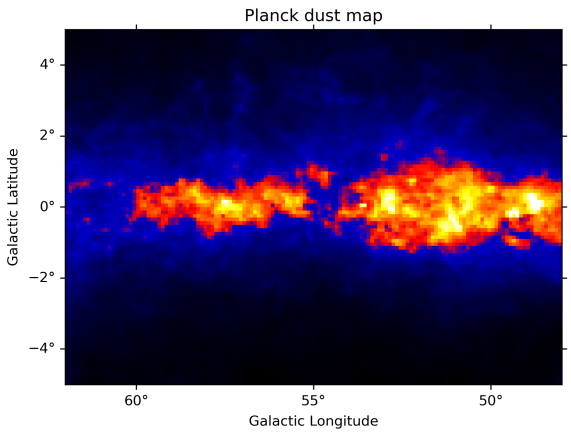
Spectrum of sources resolved from 1LHAASO

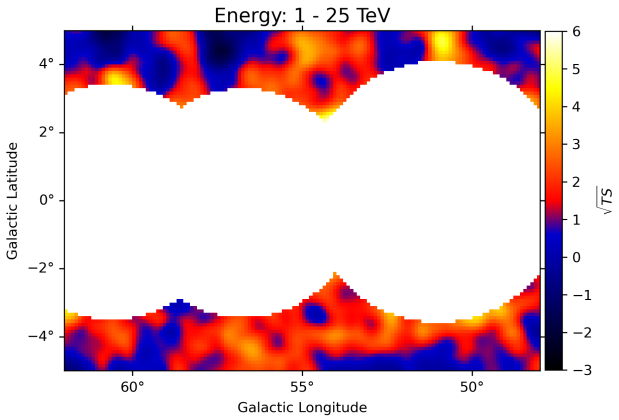


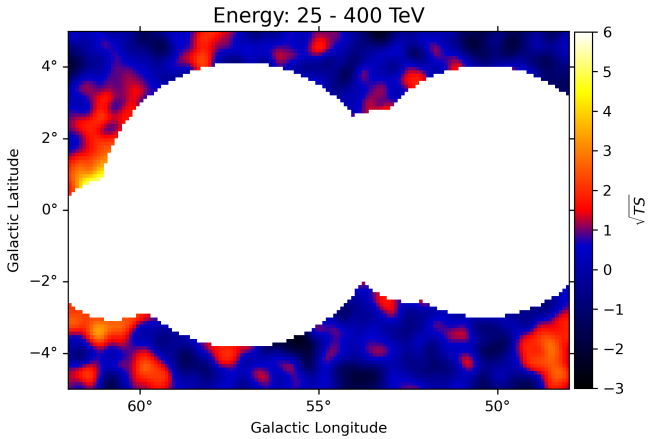
Diffuse Emission

- For the modelling of the diffuse emission, we use the Planck dust template as a spatial proxy for H_2 gas.

- The spectrum of unmasked, masked and source emission are shown in the poster.







Conclusion

- We show that new sources are resolved from 1LHAASO sources, revealing more detailed source morphology. We also present an updated diffuse emission calculation, emphasising the differences between masked and unmasked diffuse components.

- Currently, we have identified 146 sources ($\geq 5\sigma$) and 59 ultra-high-energy sources ($\geq 4\sigma, \geq 100\mathrm{TeV}$) The number of sources and their properties are being independently cross-checked by our group in coordination with the IHEP team.

Thanks for your attention!

Poster number: 29