

Contribution of young massive stellar clusters to the Galactic diffuse gamma-ray emission - [REMOTE]

Wednesday 4 September 2024 15:30 (15 minutes)

Young massive stellar clusters (YMSCs) have emerged as a potential gamma-ray sources, after the recent association of several YMSCs with extended gamma-ray emission. The large size of the detected halos, comparable to that of the wind-blown bubble expected around YMSCs, makes the detection of individual YMSCs rather challenging. As a result, the gamma-ray emission from most of the Galactic YMSCs could be unresolved, thus contributing to the diffuse gamma-ray radiation observed along the Galactic Plane.

In this talk, we present the possible contribution to the Galactic diffuse gamma-ray emission from a synthetic population of YMSCs, and we compare it with observations obtained with different experiments, from 1 GeV to hundreds of TeV, in two regions of the Galactic Plane.

As the population of galactic YMSCs is only known locally, we evaluate the contribution of gamma-ray emission relying on the simulation of synthetic populations of YMSCs based on the observed properties of local clusters. We compute the gamma-ray emission from each cluster assuming that the radiation is purely hadronic and produced by cosmic rays accelerated at the cluster's collective wind termination shock. We also include three different scenarios for particle propagation in the vicinity of the star clusters.

The results show that the gamma-ray emission from unresolved YMSCs can significantly contribute to the observed Galactic diffuse flux, especially in the innermost part of the Galaxy.

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Session Classification: Parallel 1