



Contribution ID: 36

Type: **Oral contribution**

## **Gamma-ray and X-ray study of possibly oldest GeV supernova remnant G298.6–0.0**

*Tuesday, 6 September 2022 12:05 (20 minutes)*

Hadronic  $\gamma$ -ray sources associated with supernova remnants (SNRs) can serve as stopwatches for the escape of cosmic rays (CRs) from SNRs, which gradually develops from highest-energy particles to lowest-energy particles with time. In this work, we analyze the 13.7 yr Fermi-LAT data to investigate the  $\gamma$ -ray feature in/around the SNR G298.6–0.0 region. With  $\geq 16$  GeV data, we detect two spatial components: Src-NW at the west of the SNR, and Src-S at the south of the SNR. Then, with  $\geq 8$  GeV data, we detect an additional component —Src-NE, which is inside the radio dimension of the SNR. They are all point-like sources. Their GeV spectra are in distinct shapes, suggesting different CR populations and/or different interstellar medium distributions around them. Noteworthy, the component Src-NE inside the SNR dimension demonstrates a spectral break at  $\approx 1.8$  GeV, suggesting an old SNR age of  $>10$  kyr. Among the three components, Src-S has the hardest spectrum extending to 30–100 GeV. Considering its separation from the SNR, its hard spectral shape is explainable in terms of the progress of the CR escape. We also look into the X-ray emission from the SNR region, with the Chandra-ACIS data. We detected several point-like keV sources and extended keV emission inside the SNR. We will discuss the origins of their X-rays as well as the spatial morphology of the diffuse component.

### **Collaboration**

**Primary author:** YEUNG, Paul (Kin-Hang) (University of Tokyo (UTokyo))

**Co-author:** BAMBA, Aya (U. of Tokyo)

**Presenter:** YEUNG, Paul (Kin-Hang) (University of Tokyo (UTokyo))

**Session Classification:** Galactic Astrophysical Accelerators