広島大学

広島大学 極限宇宙研究拠点
CORE-U
Core of Research for the Energetic Universe
HIROSHIMA UNIVERSITY

第76回(2022年度第07回) 極限宇宙研究拠点セミナー
(the 7th Core-U Seminar in 2022)

日時：2022年11月24日(木)12：50-14:20　Date/Time: 24th/Nov (Thu.)/2022 12:50-14:20
形式：Zoom配信　Format: online (zoom)
講師 (Speaker)：東京大学 Kin Hang (Paul) YEUNG氏 (JSPS fellow)

題目(Title)

Multiwavelength studies of G298.6-0.0: Possibly one of the oldest GeV supernova remnants

概要(Abstract)

Hadronic Gamma-ray sources associated with supernova remnants (SNRs) can serve as stopwatches for the escape of cosmic rays 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 Gamma-ray spatial analyses, we detect three point-like components. Among them, Src-NE is at the eastern SNR shell, and Src-NW is adjacent to the western edge of this SNR. Src-NE and Src-NW demonstrate spectral breaks at energies around/below 1.8 GeV, suggesting an old SNR age of >10 kyr. We also look into the X-ray emission from the G298.6-0.0 region, with the Chandra-ACIS data. We detected an extended keV source having a centrally filled structure inside the radio shell. The X-ray spectra are well fit by a model which assumes a collisional ionisation equilibrium of the thermal plasma, further supporting an old SNR age. Based on our analyses of the NANTEN CO- and ATCA-Parkes HI-line data, we determined a kinematic distance of ~10.1 kpc from us to G298.6-0.0. This distance entails a large physical radius of the SNR of ~15.5 pc, which is an additional evidence for an old age of >10 kyr. Besides, the CO data cube enables us to three-dimensionally locate the molecular clouds which are potentially interacting with SNR G298.6-0.0 and could account for the hadronic Gamma-rays detected at Src-NE or Src-NW. Furthermore, the multiwavelength observational properties unanimously imply that the SNR--MC interaction occurs mainly in the northeast direction.

Zoom link :
https://us02web.zoom.us/j/87599224214?pwd=amNYRkdSSWdDVndNOU80Wll6ZlNDUT09

本セミナーは共同セミナー（理工学融合共同演習）の対象です。先進理工系科学研究科の他プログラム専門科目，共同セミナー等の認定を受ける人は11月17日(木)-23日(水)の間に水野（mizuno@astro.hiroshima-u.ac.jp）あてに氏名および学生番号をメールで連絡して下さい
＊出席確認は，講演終了時，質疑応答前に行う
＊司会のアナウンスに応じZoomチャット機能で水野に学籍番号と名前を送る
＊セミナー終了後１週間以内(12/01木曜一杯)に水野（居室：理学部B203）にサインをもらいに行くこと。

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