

Canadian Association of Physicists

Association canadienne des physiciens et physiciens

Contribution ID: **3992** Type: **Poster not-in-competition (Graduate Student)** / **Affiche non-compétitive** (Étudiant(e) du 2e ou 3e cycle)

(POS-4) Dark Matter Annihilation in 21cm Signal at Cosmic Dawn

Tuesday 20 June 2023 17:36 (2 minutes)

Dark matter annihilation(DMA) provide an promising avenue to detect dark matter particles. Meanwhile, 21-cm line of hydrogen during cosmic dawn have great potential to reveal the information about the early galaxies and stellar formation process.

In this presentation, we elucidate the study using semi-analytic method to model the dark matter annihilation from global background and structure haloes at redshift $\sim 20-40$. Our findings reveal that dark matter annihilation inhibits gas collapse in mini halos. By considering other possible effects such as streaming velocity and feedback mechanism. We obtain a more comprehensive result and we subsequently compare with previous results.

Our result suggest that DMA has the ability to significantly alter the observable brightness temperature of 21-cm hydrogen line, and may even affect the early universe's star formation history. This work sheds light on the importance of taking into account the impact of DMA when interpreting the 21cm signal.

Keyword-1

Dark matter annihilation

Keyword-2

21-cm signal

Keyword-3

Author: HOU, Liqiang (Perimeter Institute)

Co-author: MACK, Katherine

Presenter: HOU, Liqiang (Perimeter Institute)

Session Classification: PPD Poster Session & Student Poster Competition (6) | Session d'affiches PPD et concours d'affiches étudiantes (6)

Track Classification: Technical Sessions / Sessions techniques: Particle Physics / Physique des particules (PPD)