



Contribution ID: 606

Type: **Poster contribution**

Monte Carlo simulations of proton acceleration in colliding wind binaries

Tuesday 4 August 2015 16:00 (1 hour)

Particles accelerated at the shocks forming at the wind collision region of a binary system of massive stars are expected to produce γ -rays dominantly either through inverse Compton scattering of electrons in the stellar radiation fields, or through the decay of neutral pions produced in proton-proton collisions.

Up to now, the only colliding wind binary (CWB) associated with γ -ray emission is η Carinae, where two components seem to be present. So far, there is no evidence for γ -ray emission from other binary massive star systems, such as WR 140 or WR 147, which were expected to be detected with comparable or even higher fluxes.

We investigate injection and acceleration of protons in a typical CWB system by means of Monte Carlo simulations with a test-particle approach. We rely on hydrodynamic simulations for determining the background conditions in the wind collision region. Both shocks on either side of the contact discontinuity are considered, looking for different accelerated particle populations, that could result in different components of the γ -ray spectrum. Such studies may contribute to understand the lack of detection of γ -rays from most of these CWB systems up to now.

Collaboration

– not specified –

Registration number following "ICRC2015-I"

541

Author: GRIMALDO, Emanuele

Co-authors: REIMER, Anita (University of Innsbruck); Dr KISSMANN, Ralf (University of Innsbruck)

Presenter: GRIMALDO, Emanuele

Session Classification: Poster 3 CR

Track Classification: CR-TH