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M. Breuhaus: Further support for a hadronic origin for the γ -ray emission from η Carinae

η Carinae is a unique laboratory in which to study particle acceleration to high energies under a wide range of conditions, including extremely high densities around periastron. So far no consensus has emerged in the origin of the GeV γ -ray emission in this important system. With a re-analysis of the full Fermi-LAT data set for η Carinae, we show that the spectrum is consistent with a pion decay spectrum and not with a broken power law connecting to the X-ray emission as has been claimed. We show with a simple physical model that pion-decay emission is the most likely origin of all of the γ -ray emission, with inverse Compton emission from primary electrons dominating the hard X-ray emission detected with NuSTAR at most phases. Very close to periastron it seems possible that secondary electrons interacting away from the shock cap dominate the emission. Future observations with H.E.S.S., CTA and NuSTAR should enable this scenario to be further constrained.

Classification de Session: Students' presentations