Contribution ID: **12** Type: **not specified**

Temporal evolution of high energy radiation in type IIn Supernovae

Wednesday 18 October 2017 12:45 (15 minutes)

The dominant models that can describe the non - thermal radiation by high energy astrophysical objects, can be divided into two categories, i.e. the leptonic and the hadronic ones. The former one suggests that the high energy radiation is produced by physical processes associated with a population of highly relativistic electrons. On the other hand, the hadronic model assumes that the observed gamma ray emission originates from a population of relativistic protons. The physical process which is responsible for the emission in this case could be the non elastic proton - proton collisions. In this physical process, relativistic protons interact with thermal ones and as a consequence, secondary particles such as charged and neutral pions ($\pi^{\pm}$, π^{0}), muons ($\mu^{\pm}$), neutrinos ($\nu_{e,\mu}$) and photons are produced. In this talk, we present the results of the radiation from proton-proton collisions as applied to type IIn Supernovae. This type of Supernova has different properties than the usual types due to the presence of a very dense upstream medium, of the order of $10^{7} - 10^{12}\ cm^{-3}$, which has been formed by the progenitor's mass loss. Consequently, if protons do manage to accelerate at the shock wave, then it is much more possible for proton - proton collisions to occur at such type of sources. In the meantime, the aforementioned thick upstream medium seems to play a significant role in the temporal evolution of the non - thermal radiation emitted by these sources. We will present some preliminary results and discuss their relevance to potential observations.

Primary author: Mr KANTZAS, Dimitrios (University of Amsterdam)

Co-authors: Dr PETROPOULOU, Maria (Purdue University); Prof. MASTICHIADIS , Apostolos (National and Kapodistrian University of Athens)

Presenter: Mr KANTZAS, Dimitrios (University of Amsterdam)

Session Classification: Contributed talk - High-energy astrophysics