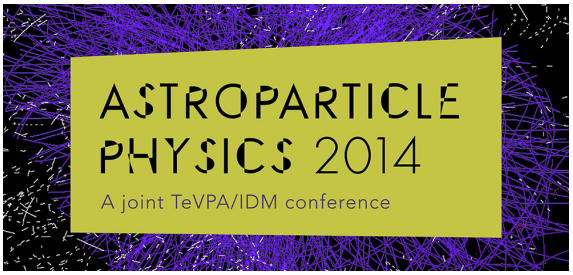

Contribution ID: **231** Type: **Presentation**

On the CR spectrum released by a type II Supernova Remnant expanding in the presupernova wind.

Monday, June 23, 2014 4:30 PM (18 minutes)

One of the main open issues about the origin of Galactic CRs is the maximum energy that can be achieved by acceleration in Supernova Remnants.
In a rigidity dependent acceleration mechanism, protons are expected to reach a few PeV and heavier ions correspondingly higher energies.
A recent theory suggests that, in a core-collapse SNR expanding in its pre-supernova wind, magnetic field amplification through the so called Non-Resonant Hybrid Instability (NRH) could explain energies of the PeV order. If this instability is the main responsible for particle scattering, then the maximum achievable energy in a SNR is reached very early during its evolution and then decreases at later stages.
In this work, assuming that the maximum energy is set by the NHR instability at every time during the evolution of a type II Supernova Remnant, we computed the particle spectrum injected in the ISM by this kind of source. We showed that the released particle spectrum is a power-law both during the Ejecta dominated and the Sedov-Taylor expansion phase, but with a steeper index during the first. We address the question of whether this mechanism can naturally reproduce the observed overallCR spectrum up to energies of order 100 PeV.

Primary author: CARDILLO, Martina (INAF - Osservatorio astrofisico di Arcetri)

Co-authors: AMATO, Elena (INAF - Osservatorio Astrofisico di Arcetri); Prof. BLASI, Pasquale (INAF-Osservatorio astrofisico di Arcetri)

Presenter: CARDILLO, Martina (INAF - Osservatorio astrofisico di Arcetri)

Session Classification: Cosmic Rays

Track Classification: Cosmic Rays