



Contribution ID: 272

Type: **Presentation**

## SNR shocks in partially ionized plasmas

*Monday, June 23, 2014 5:24 PM (25 minutes)*

We present the theory of non-linear particle acceleration in collisionless shocks in the presence of atomic neutral material in the acceleration region. The main new aspect consists in accounting for charge exchange and ionization of neutral hydrogen, which profoundly change the structure of the shock. We also present the self-consistent calculation of the Balmer emission lines from the shock region: the broad Balmer line due to charge exchange of hydrogen atoms with hot ions downstream of the shock is shown to become narrower as a result of the energy drainage into cosmic rays, while the narrow Balmer line due to charge exchange in the CR-induced precursor is shown to get broader. We discuss the potential use of the measurements of the anomalous width of the components of the Balmer line in order to infer the cosmic ray acceleration efficiency in supernova remnants showing Balmer emission.

**Primary author:** MORLINO, Giovanni (G)

**Presenter:** MORLINO, Giovanni (G)

**Session Classification:** Cosmic Rays

**Track Classification:** Cosmic Rays