ICRC
The Astroparticle Physics Conference
34th International Cosmic Ray Conference
July 30 - August 6, 2015
The Hague, The Netherlands

Contribution ID: **1188** Type: **Oral contribution**

Origin of cosmic rays excess in the Galactic Center

Thursday, 30 July 2015 14:45 (15 minutes)

The center of our Galaxy hosts a Super-Massive Black Hole (SMBH) of about 4×10^6 M_{sun}. Since it has been argued that the SMBH might accelerate particles up to very high energies, its current and past activity could contribute to the population of Galactic cosmic-rays (CRs). Additionally, the condition in the Galactic Center (GC) are often compared with the one of a starburst system. The high supernovae (SN) rate associated with the strong massive star formation in the region must create a sustained CR injection in the GC via the shocks produced at the time of their explosion.

Indeed, the presence of an excess of very high energy (VHE) cosmic rays in the inner 100 pc of the Galaxy has been revealed in 2006 by the H.E.S.S. collaboration. On very large scale ($\approx$ 10 kpc), the non-thermal signature of the escaping GC cosmic rays could have been detected recently as the spectacular "Fermi bubbles". The origin of the CRs over-abundance in the GC still remains mysterious: is it due to a single impulsive or stationary accelerator at the center or to multiple accelerators filling the region? In order to answer these questions, we build a 3D model of CR injection and propagation with a realistic 3D gas distribution. We then compare with existing data (H.E.S.S., Fermi).

We discuss the CR injection in the region by a spectral and morphology comparison. We place constrains on the SNR rate and on the diffusion parameters.

Collaboration

– not specified –

Registration number following "ICRC2015-I/"

842

Primary author: Mrs JOUVIN, Lea (APC)

Co-authors: Mrs LEMIERE, Anne (APC); Mr TERRIER, Regis (APC)

Presenter: Mrs JOUVIN, Lea (APC)

Session Classification: Parallel GA 04

Track Classification: GA-TH