Contribution ID: **820** Type: **Parallel session talk**

Supermassive black holes from PeVatrons to ZeVatrons

Friday 19 July 2024 17:45 (15 minutes)

It is often speculated that supermassive black holes (SMBHs) located at the centers of many galaxies can serve as possible sources of ultra-high-energy cosmic rays (UHECR). This is also supported by numerous observations of high-energy neutrinos and gamma-rays from the direction of blazars and other SMBH candidates. In this talk, I will present a novel scenario of particle acceleration involving electromagnetic extraction of rotational energy from the central black hole. I will show that for typical SMBH of a billion solar masses, the energy of an accelerated proton can reach ZeVs, while applied to the Galactic center SMBH, the proton energy reaches a few PeV, coinciding with the knee of the observed cosmic ray spectrum. I will also discuss the expected energy spectrum and particle composition of the presented model.

Alternate track

I read the instructions above

Yes

Author: TURSUNOV, Arman

Presenter: TURSUNOV, Arman

Session Classification: Astro-particle Physics and Cosmology

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