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## Are gamma rays produced in the core region of microquasars and AGNs?

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Cosmic Ray (CR) acceleration is still challenging in high energy astrophysics. A first-order Fermi mechanism within magnetic reconnection layers has been demonstrated to be a powerful CR accelerator in recent studies. In this work we have investigated this acceleration process in the nuclear region of radio-galaxies and microquasars and found that the very high energy (VHE) emission from these astrophysical sources may be originated in the nuclear region around the central black hole. We employed both leptonic and hadronic models to interpret the observed gamma emission resulting from interactions of accelerated particles by magnetic reconnection with the ambient radiation, magnetic and matter fields. We compared the acceleration rate with the proper cooling rates obtaining the maximum particle energy and then reconstructed the spectral energy distribution (SED) for a few galactic and extragalactic sources and found that they are consistent with the observations. Also this model naturally explains the fast time variability of the emission of these sources.

### Collaboration

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