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A HADRONIC SCENARIO FOR THE GALACTIC RIDGE EMISSION

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During the last decade the innermost part of our galaxy has been observed as a gamma-ray emitting region described by a ridge-like surface. In particular, in 2005 the H.E.S.S. collaboration reported the measurement of a power-law spectrum with index close to -2.3, between 0.1 and 10 TeV, strongly correlated with dense molecular clouds in that region. Last year the VERITAS collaboration confirmed that finding. Below that energy a diffuse non-thermal emission was also found by the Fermi-LAT observatory with a spectrum, related to this region, which can be smoothly connected to that measured by H.E.S.S.
Although several hypotheses have been proposed for the origin of that emission - e.g. flaring activity of the SgrA* supermassive black hole as well as steady leptonic and hadronic emission from freshly accelerated cosmic rays (CR) - it was recently shown as those results can be consistently interpreted in terms of hadronic emission produced by the Galactic CR population in the presence of radial dependent transport.
Since the Galactic CR spectrum extends at least up to several PeVs, a very high energy neutrino emission is expected from the considered Galactic Center region which should exceed the atmospheric background for a kilometric scale neutrino telescope.
Here, we adopt such scenario to estimate the expected signal in the IceCube observatory and compare it with its recent results.
Moreover, we will discuss the detecting chances of neutrino telescopes in the North hemisphere, as ANTARES and the future KM3NeT, which are better positioned for the observation of the Galactic Ridge.

Collaboration

– not specified –

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