

ISOTROPIZATION OF ULTRA-HIGH ENERGY COSMIC RAY ARRIVAL DIRECTIONS BY RADIO GHOSTS

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The isotropy in the ultra high energy cosmic ray (UHECR) flux observed by Yakutsk and AGASA experiments, is a very strong constraint to production and propagation models alike. Most of the scenarios proposed in the literature should produce a sizable anisotropy as either extragalactic luminous or dark matter is normally associated with the invoked particle sources. We explore the possibility that the magnetic fields in fossil cocoons of former radio galaxies – so called *radio ghosts* – are able to scatter UHECR in the intergalactic medium giving rise to the observed isotropy. We show, through numerical simulations, under which conditions this process can be operative and the magnitude of the effect. We further demonstrate, that if radio ghosts mix with the ambient medium, they might be able to produce the observed magnetic fields in clusters of galaxies. In the case of mixing, the UHECR isotropization would be even stronger than in our conservative estimates.