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The Diffuse Extragalactic Radio Background and the implications for gamma-ray astrophysics

Radio emission from normal galaxies and radio galaxies is due to synchrotron radiation by relativistic electrons accelerating helically in the presence of a magnetic field. At low frequencies (in the kHz to GHz frequency band), the radio emissions accumulate over cosmological time to form a diffuse background that is similar to the cosmic microwave background (CMB). This background is known as the diffuse Extragalactic Radio Background (ERB). In this work, we produce an updated Protheroe and Biermann (1996) ERB model and test it against radio survey data at different redshifts using the evolution of galaxies with cosmic time. We conclude by presenting the implications for gamma-ray astrophysics, and therefore use our resulting ERB model to calculate the opacity of ultrahigh-energy gamma-rays in the universe.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

Primary author: MOTHA, Nomthendeleko**Co-author:** RAZZAQUE, Soebur (University of Johannesburg)**Presenter:** MOTHA, Nomthendeleko**Session Classification:** Astrophysics**Track Classification:** Track D1 - Astrophysics