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Fermi Bubbles as a probes of Galactic halo environment

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Fermi bubbles are giant gamma-ray structures seen above and below the Galactic plane with characteristic size of order of 10 kpc. They also show very good correlation with the microwave emission discovered by the WMAP telescope and the residual diffuse emission in the range above 30 GHz found by the Planck satellite. Correlation between gamma-ray emission observed by Fermi and radio emission observed by Planck implies the presence of high-energy particles in the area covered by Fermi bubbles. These particles may be produced in the Galactic center or accelerated in-situ. Since size of Fermi Bubbles is extremely large, potential transport and acceleration processes are strongly affected by Galactic halo environment and also can affect distribution of Galactic cosmic rays. Thus Fermi Bubbles can be considered as a interesting probe of the magnetic field strength and cosmic ray concentration in the Galactic Halo. We provide a multi-wavelength analysis to set some restrictions on potential models of Fermi bubbles as well as on the propagation of cosmic rays in the central region of our Galaxy.

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