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Natural model for the Fermi bubbles and Galactic haze

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We show that the Fermi Bubbles and the Galactic haze are naturally interpreted as inverse-Compton and synchrotron emission from the same spectrum of cooling cosmic ray electrons. This avoids the ad-hoc spectral features and superfluous acceleration mechanisms typically assumed. The model implies that the bubbles originated 2-3 Myr ago, the mean magnetic field in the haze region is ˜3\muG, and the radiation field in the bubble is dominated by starlight with mean energy density >2eV/cmˆ3. These parameters imply that the bubbles accelerate cosmic ray protons (iron nuclei) up to energies of ˜5·10ˆ{17}eV (˜10ˆ{19}eV).

In contrast, a hadronic model fails to naturally account for the gamma-ray spectrum of the bubbles, in particular once the haze-emitting electrons are taken into account.

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