OPTICAL RADIATION FIELD IN THE DISK AND HALO

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The imminent launch of NASA's Gamma Ray Observatory (GRO) has focussed on the need to provide up to date estimates of the energy density of interstellar radiation away from the Galactic Plane, this parameter being a prerequisite for calculation of the flux of gamma rays coming from the inverse Compton scatterings of cosmic ray electrons. In this work we use recent information on the stellar distributions and on the extinction properties of dust in the interstellar medium in the calculation. An important feature of the radiation field is that the field energy density is still substantial in the halo, as was found in our previous work. The differences between groups are due to the total energy input and the dust distribution. Our ensuing energy densities are probably accurate to about 30%, the uncertainty being due to lack of precise knowledge of the input parameters rather than approximations used in the calculation. The result is given by a contour map in Figure 1.

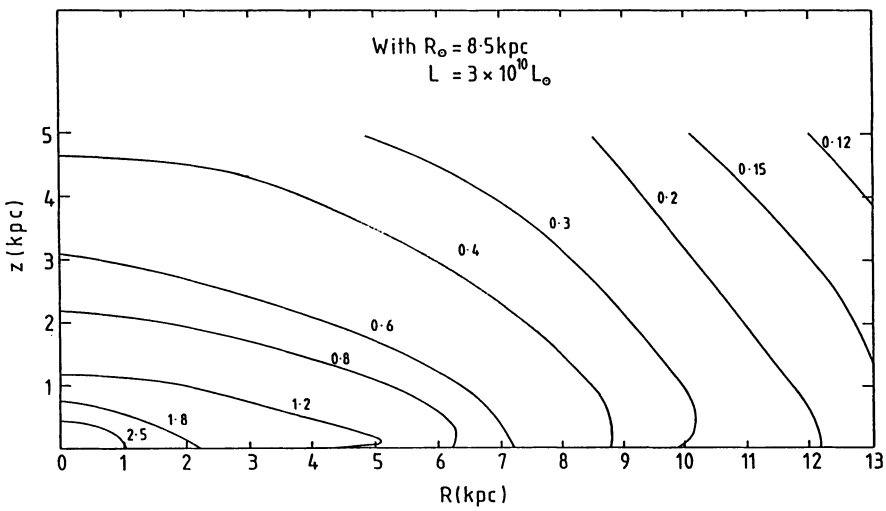

Figure 1. The distribution of the OPT energy density in the Galaxy, with $R_{\odot} = 8$ kpc and $L_{\mathrm{OPT}} = 3 \times 10^{10} L_{\odot}$. The wavelength range of the OPT is defined as 0.1 μm $< \lambda <$ 8 μm. The units in the contour map are eV cm^{-3}.

H. Bloemen (ed.), The Interstellar Disk-Halo Connection in Galaxies, 198.