ANALYTICAL SOLUTION OF 3-D COSMIC-RAY DIFFUSION IN THE GALAXY WITH BOUBDARYLESS HALO (II) — TWO COMPONENT MODEL —

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We derive an analytical solution of three dimensional cosmic-ray diffusion in the Galaxy with two-component scale heights, one corresponding to the disk and the other to the halo, assuming that three critical parameters, D (diffusion coefficient), n (gas density) and ρ (cosmic-ray source density), are of the exponential type in both r (radial distance from the disk center) and z (vertical distance from the galactic plane), where the distribution of D, n and ρ have two scale heights, one set with $[z_{Dg}, z_{ng}, z_{\rho g}]$ for $z \leq z_c$ and the other with $[z_{Dh}, z_{nh}, z_{\rho h}]$ for $z \geq z_c$. We expect the former three heights are of the order of magnitude with a few hundreds pc, while the latter three are of the order of magnitude more than a few kpc.