

Origin of the characteristic shape of boron-to-carbon ratio as a function of energy

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Abstract. One major parameter of cosmic rays, the grammage, is determined by the boron-to-carbon flux ratio and other similar ratios like, for example, ${}^3\text{He}/{}^4\text{He}$. The characteristic of the B/C ratio is the existence of a peak, positioned around 1 GeV/u, where the ratio is 0.32 smoothly decreasing to 0.10 at 100 GeV/u. A calculation of B/C ratio versus energy using the simulation of carbon and boron trajectories in the galactic magnetic field is presented. The effects of source distribu-

tion, magnetic field, galactic boundaries and interstellar matter density is studied and a detailed account of the peculiarities of the B/C ratio versus energy is given. The grammage inferred from the B/C ratio of this calculation is compared with that obtained in diffusion and leaky box models.

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