ON THE CONNECTION OF TOTAL CROSS SECTIONS WITH THE IMAGINARY PART OF THE SCATTERING FORWARD AMPLITUDE AND THE DIFFRACTION CONE SLOPE PARAMETER

Sh. Kh. Djuraev, E. I. Ismatov, K. A. Kuterbekov, S. B. Strigina, Sh. P. Esanniazov, M. I. Fazylov

Institute of Nuclear Physics,
Acad. Sci. of Uzbekistan Rep.
(Ulugbek, Tashkent 702132, Uzbekistan)

S u m m a r y

We derive the formulas connecting the ratio of the total cross-sections σ_{el}/σ_t and the ratio of the total cross-section to the diffraction cone slope parameter σ_t/b with the ratios of the real and imaginary parts of the scattering forward amplitude. The semi-quantitative consideration is done. It is shown that the results become better due to the more precise calculation of the diffraction cone slope parameter and to the influence of the parameter $c > 1$. Comparison with the experimental data on pp- and $p\bar{p}$-interaction shows better agreement in a wide range of energies $\sqrt{s} = 5 \div 546$ GeV. It is important to note that the relations obtained lead to a large value of the ratio of the real part of the scattering forward amplitude to its imaginary part at $\sqrt{s} = 546$ GeV comparing to the values given by many theoretical models and the calculations by the dispersion relations.