27-DAY VARIATIONS OF COSMIC RAYS FOR THE MINIMA EPOCHS OF SOLAR ACTIVITY: EXPERIMENTAL AND 3-D DRIFT MODELING RESULTS

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Neutron monitors, solar and geomagnetic activities data have been used to study the first (27 days) and the second (13.5 days) harmonics of the variations of galactic cosmic rays connected with the rotation of the Sun. To compare the features of the character of the modulation of galactic cosmic rays in different solar magnetic cycles qA>0 and qA<0 four the near minima and the minima epochs of solar activity, 1964-1966 and 1986-1988 (qA<0), and 1975-1977 and 1996-1998 (qA>0) have been considered. It is shown that the amplitudes of both of the first and the second harmonics (27 days and 13.5 days) of galactic cosmic ray variations connected with the Sun's rotation are ~ 1.5 times greater for the qA>0 solar magnetic cycle, than for the qA<0 magnetic cycle based on the data of neutron monitors with the low (~2 GV) and high (~14 GV) cut off rigidities. These results are confirmed by the solutions of the Parker's 3-dimentional transport equation with the flat heliospheric current sheet for different qA>0 and qA<0 magnetic cycles. For the equal other conditions (in sense of the same parameters characterized transport equation) the amplitude of the 27- day variations of galactic cosmic rays is about 2 times greater for the period of the qA>0 solar magnetic cycles than for the qA<0 solar magnetic cycles. Nevertheless, there are certain difficulties in single valued interpretation of the above-mentioned experimental and modeling results.