

# **Empirical relations between the cosmic ray flux and the heliospheric current sheet tilt angle**

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One of the main factors in the heliospheric modulation of galactic cosmic rays is the tilt angle of the heliospheric current sheet, which is formed as an interface between the oppositely directed field lines of the HMF and corresponds to the heliomagnetic equator. The structure of the current sheet is defined by the tilt angle between the magnetic and rotational axes of the Sun, which depends on the phase of the solar cycle. Due to the charge-dependent drift of cosmic rays along the current sheet, variations of the tilt angle in the course of the solar cycle results in a notable variation of cosmic ray flux in the Earth's vicinity. An empirical model, relating the cosmic ray flux with such global heliospheric parameters as the tilt angle, the open solar flux and the polarity of the heliospheric magnetic field, was developed. Inverting this model, we study a possibility to evaluate the tilt angle in the past, before its measurements. Comparing the model results with the actual measurements of the tilt angle which have been carried out for the last 30 years, we confirm the validity of the method. Finally, we extend our model to cover the last 55 years, providing thus an estimate of the tilt angle for nearly 20 years before the actual measurements.