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Magnetic neutrino resonant spin-flavor precession, 1. Time variations of solar electron neutrino fluxes

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Abstract. Time variations of solar neutrino flux and its dependence from the heliolatitude (where neutrino reaching the Earth crossed the Sun's surface) are investigated on the bases of available Homestake experimental data (Cleveland et al., 1998) for more than two solar cycles (1970-1994). We determine (with the same weight-time function what was used in Cleveland et al.(1998) for determining solar neutrino flux) for each solar neutrino run n following parameters: effective helio-latitude Lef(n), effective Zurich sunspot number Zef(n), total effective surface of sunspots STef(n), as well as effective surfaces of sunspots in different symmetrical heliolatitude zones: S7.5ef(n) zone (what includes three 5-degrees zones from -7.5 degrees to -2.5 degrees, from -2.5 degrees to +2.5 degrees and from +2.5 degrees to +7.5 degrees), S12.5ef(n) zone (includes five 5-degrees zones from -12.5 degrees to +12.5 degrees), S17.5ef(n) zone (includes seven 5- degrees zones from -17.5 degrees +17.5 degrees), and S22.5ef(n)$ (includes nine 5 degrees zones from -22.5 degrees to +22.5 degrees). We found that in periods of solar activity decrease in even solar cycles 20 and 22 the correlation of solar neutrino flux with solar activity change the sign and became positive. This explains why for total period 1970-1994 negative correlation coefficient became so small, that many scientists came to conclusion on absence of solar neutrino real time variations. The interpretation of obtained results is based on the standard solar model of electron neutrino generation in thermo -nuclearprocesses and theory of magnetic neutrino resonant spin-flavor precession.

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