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Space weather influence on the Earth's ecosystems: principles of great geomagnetic storms forecasting by on-line cosmic ray data using

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According to NOAA Space Weather Scales, geomagnetic storms of scales G5 (3-hour index of geomagnetic activity Kp=9), G4 (Kp=8) and G3 (Kp=7) are dangerous for satellites, aircrafts, and even for technology on the ground (influence on power systems, on spacecraft operations, on HF radio-communications and others). We show on the basis of statistical data that these geomagnetic storms, mostly accompanied by cosmic ray (CR) Forbush-decreases, are dangerous also for people's health on spacecrafts and on the ground (increasing the rate of myocardial infarcts, brain strokes and car accident road traumas). To prevent these serious damages it is very important to forecast dangerous geomagnetic storms. Here we consider the principles of using CR measurements for this aim: to forecast at least 10-15 hours before sudden commencement (SC) of great geomagnetic storms accompanied with Forbush-decreases - by using neutron monitor (NM) – muon telescope (MT) world-wide network on-line hourly data. We show that for this forecast one may use the following features of CR intensity variations connected with geomagnetic storms accompanied by Forbush-decreases: 1) CR pre-increase, 2) CR pre-decrease, 3) CR fluctuations, 4) Change in 3-D CR anisotropy.
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