

Spectrometer for study of charge state of high-energy ions generated in active processes on the Sun

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Today a problem of acceleration and transport of charged particles in solar active processes (flares, shocks) is important as usual. Some current and future space experiments (ACE, MONICA) are aimed for the measurement of a number of physical characteristics of solar energetic particles (SEP) such as intensity, composition, energy spectra et al. Among them there is a poorly investigated charge state distribution of high-energy ions. Ions of iron in SEP is especially valuable for study because they contain information about temperature in the acceleration region on the Sun and thickness of solar substance passing by SEP. Method based on using of Earth's magnetic field and onboard satellite instrument (telescope-spectrometer) for nuclear identification is applied for solving this experimental task. Spectrometer-telescope consisting of plastic scintillation and silicon layers is proposed for nuclear identification and considered in detail in this report. Main physical performances of instrument (energy range, energy resolution, nuclear charge resolution, et al.) were determined by numerical modeling technique. Comparison of this instrument with other ones from point of view of the possibility of charge state study was fulfilled.

Presentation type

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