

THE COSMIC RAY NUCLEI AND EYE LIGHT FLASHES IN SILEYE EXPERIMENT ONBOARD THE MIR SPACE STATION

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The SilEye-2 particle telescope was placed on Mir from October 1997 to June 2000. It consists of 6 active silicon strip detectors which allow charge and energy identification of cosmic ray particles in the energy range $\sim 30 - 200$ MeV/n. The apparatus is attached to a helmet with mask, which shielded cosmonaut eyes from light. The phenomenon of Light Flashes (LF) in eyes for people in space has been investigated onboard Mir space station. Data on particles hitting the eye have been collected with the SilEye-2 detectors and correlated with human observations. In the period 98/99, we have 17 sessions with simultaneous SilEye-2 detector and LF observation data. 116 LFs were seen during about 800 minutes of observation. An additional 30 LFs were noted during three observation sessions amounting to 250 minutes without silicon detector. 59414 protons and 479 nuclei passed through eyes were registered with SilEye-2 telescope. It is found that a nucleus in the radiation environment of Mir has roughly a 1% probability to cause a LF, whereas the proton probability is almost three orders of magnitude less. As a function of LET (Linear Energy Transfer in water), the LF probability increases above $10 \text{ keV}/\mu\text{m}$, reaching about 5% around $50 \text{ keV}/\mu\text{m}$.