

ELECTROMAGNETIC EMISSION
BURSTS FROM THE NEAR-CUSP REGIONS
OF SUPERCONDUCTING COSMIC STRINGS

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S u m m a r y

The cosmic strings are relicts of the early Universe which can be formed during the phase transitions of fields with spontaneously broken symmetry. Here, the motion of the near-cusp region of a superconducting cosmic string in the cosmic plasma with a large Lorentz-factor is studied. The characteristics of nonthermal emission of electrons of the cosmic plasma which are accelerated on the front of a shock wave around of the near-cusp region are calculated. All important channels of the emission and various cooling regimes of the plasma are considered. It is shown that, due to the relativistic collimation of the emission flow and the Doppler shift of its frequency, the hard (X-ray and gamma-) emission of cosmic strings (loops) can be registered even at cosmological distances. The emission flows are periodic and narrow-directed and has character of bursts. The expected flows, which are $\nu F_\nu \sim 10^{-12} - 10^{-14}(\text{erg}/\text{cm}^2 \cdot \text{s})$ for strings on the Grand Unified Theory scale, can be registered with the help of modern cosmic X-ray and land-based Cherenkov telescopes.