PROCESSING OF AURORAL TV IMAGES

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Modern achievements of computer technique allows to process in digital form dynamic TV signal of various phenomena, including aurora and another optical effects in the atmosphere. The paper shows some of the possibilities of image enhancement and restoration using auroral samples.

At present the developed software supports the following functions: 1) linear and median filtering by various adaptive filters; 2) histogram, amplitude, field and size correction; 3) geometrical correction such as distortion removing, rotation, mirroring; 4) obtaining the first and the second derivatives; 5) using images in arithmetical expressions as operands; 6) presentation of images as rasters, equipotential lines, 3-D surfaces.

Temporal variations of luminosity is obtained by processing of a consequence of TV frames with the resolution achieving the duration of a single TV frame (0.02s). They can be presented in the form of photometer recordings of any particular region of TV display or in the form of aurorograms i.e spatial-temporal variations along any certain direction chosen beforehand.

All functions are illustrated by figures for several events of aurora. TV frames were digitized by TV frame graber installed to PC-386 in 256*256, 360*256 and 720*512 6-bit grid format. The software is performed in MS-FORTRAN V5.0 texts or executive modules.