

SPACE EXPLORATION SYMPOSIUM (A3)
Solar System Exploration (5)

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IDENTIFICATION AND PREDICTION OF EARTHQUAKES BY SATELLITE DATA OF THE
NEAR-EARTH PLASMA PARAMETERS' MEASUREMENTS**Abstract**

Detectors of the neutral (DN) and charged (DE) particles were included into the spacecraft "Sich-2" scientific complex. Though the equipment was appropriated for the technological experiment, original scientific results were gotten in the flight. Using of DN and DE detectors allowed us to solve the problem of unbalanced ionospheric plasma contact (probing) diagnostic. With the help of the developed procedure of the analysis and processing equipment detectors' output signals there were gotten spatio-temporal distributions of the kinetic parameters, which characterized the condition of near-satellite environment: temperature and concentration of the electrons, ions and neutrals, space charge potential (plasma). Identification procedure of ground-based sources of disturbances for these distributions was developed. Based on probing measurements of ionospheric plasma on the spacecraft's "Sich-2", "SROSS-C2", "DEMETER", "Meteor-Priroda" it has been shown that fluctuations of charged particles' (electrons', ions') concentrations and the temperature of the heavy particles (neutrals, ions) can be used for identification and prediction of earthquakes epicenters' spatio-temporal localization for 3 days relative to satellite overpass. The results of "Sich-2" satellite onboard researches correlate with the data of the earthquakes epicenters' identification by the fluctuations of the total electron content, measured by the GPS satellites signals' delay registered with the ground-based stations, and fluctuations of the ionospheric plasma critical frequencies, which are measured by the radio-physical instruments onboard Russian satellites. In this case probing measurements give local values of the electron concentration and heavy particles temperature so the accuracy of earthquakes epicenters' identification and prediction, based on the satellites probing measurements, is much higher.