

## ABSTRACT

**Master's dissertation on the topic:** «Intelligent system of automatic microsatellite control» contains: 94 pages, 30 tables, 27 figures and 48 sources.

**Object of research:** The intelligent system of automatic control is designed for the angular orientation of the microsatellite in the orbital coordinate system.

**Subject of research:** Intelligent system of automatic control of microsatellite.

**Purpose:** development of a sustainable intelligent system of automatic control of microsatellite.

### **Results and their novelty:**

1. The general structure and principle of functioning of the microsatellite in standard mode with the instrument set are considered.
2. The linear-quadratic controller has been developed that uses a linearized model with a state vector of quaternions and the object's angular velocity.
3. That is found that the controller has high control quality indicators for the perturbing moments, but the linearized model requires a rough initial positioning within  $8,32^\circ$  for further accuracy of at least  $0,01 \text{ }^\circ/\text{c}$ . Theoretical calculations are confirmed by system simulation in the MATLAB environment.

### **Recommendations regarding the use of work results:**

Mathematical and software has been developed, allowing to select parameters of the control system by numerical modelling, which can be used for many important tasks, including remote sensing of the Earth's surface, ionospheric research, Environmental monitoring and earthquake forecasting, etc.

**Keywords:** intelligent control system, microsatellite, orientation and stabilization system, linear-quadratic regulator, perturbation moment, quaternions.