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DESIGN OF THE READOUT ELECTRONICS FOR THE FAST TRIGGER AND TIME OF FLIGHT OF THE GAMMA-400 GAMMA RAY TELESCOPE

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The GAMMA-400 gamma-ray telescope is planned for the launch at the end of this decade on the Navigator service platform designed by Lavochkin Association on an elliptical orbit with following initial parameters: an apogee ˜300000, a perigee ˜500 km, a rotation period ˜7 days and inclination of 51.4º. The apparatus is expected to operate more than 5 years, reaching an unprecedented sensitivity for the search of dark matter signatures and the study of the unresolved and so far unidentified gamma-ray sources. An electronics system, which consists of 16 front end electronics modules and the main processing unit with a total power consumption of about 400 W, has been developed for providing fast trigger and veto for the data taking to the experiment. The communication between front end modules, main processing unit and scientific data acquisition system of the gamma ray telescope is performed via high-speed SPACEWIRE network. To assure the long-term reliability in space environment, a series of critical issues such as the radiation hardness, thermal design, components and board level quality control, warm and cold redundancy are taken into consideration. The main design concepts for the system, measurements setups together with test results are presented.

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