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Oksentyuk V.M., Krevnyuh A.B., Dzyoba T.J.

NU "Lviv polytechnic", SKB of Electromechanical system

COMPUTER MODELLING OF COLLECTOR AND AC ELECTRONIC EXECUTIVE MOTORS OF OPTICAL TELESCOPE

This paper describes the optical reflecting telescope (OT), celebrated a mirrors mass about 20 tons and a large inertia moment - about 160 000 kg•m2 for azimuth rotation axis. Trying to get the best observations showings leads to a complication of tasks, performed by OT aiming electric drives (ED).

That is why, direct drive based on ac electronic direct drive constant voltage torque motor is used for prospective telescope. Adjustment and choosing the best control system (SAC) version on the real OT object is associated with considerable difficulties.

Therefore, at first it is advisable to provide mathematical computer SAC modeling of positional telescope ED on a mathematical model and then start physical tests. The mathematical description of the ac electronic motors is quite difficult and cumbersome when using the synthesizing control systems in mathematical tools. Instead, classical mathematical model of a direct current motor with permanent magnet excitation is simple, widely adapted and allows to receive the necessary decisions of various SAC synthesis process mathematical problems without complications of mathematical description. Therefore, to prove the applicability of alternative simple and informative mathematical description control object – ac electronic direct current motor, an executive commutator and ac electronic motors of OT ED comparative analysis was held, their mathematical models in different modes were investigated, the features were founded and positional telescope ED SAC, build on the closed-loop principle speed, was synthesized. As a result, it was found that the static and dynamic characteristics are similar with a small percentage differences (5%). Therefore, for a further OT ED research, when the dependence between the executive motor moment and the angular speed of the input voltage, but not its design, is important, mathematical model of collector engine is chosen.

The theoretical investigations results physically implemented on an experimental stand (SCB of electromechanical systems "Lviv Polytechnic"), which is designed for electric torque motors and low-speed rate generator for direct drive ED testing. Experimental studies of developed SAC by OT ED speed have confirmed the correctness of the mode decisions.