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FORTE: ISON ROBOTIC TELESCOPE CONTROL SOFTWARE

**Abstract**

From the point of view of observational astronomy, space surveillance has a number of important features that make it very different from most of the classical fields of research. Among others, such features are a demand for extremely accurate timing, complex tracking modes, dynamic tasking, high data acquisition rate, and often unusual telescope setup that may include e. g. multiple optical channels working simultaneously. One needs to take all this into account to ensure an adequate telescope control system (TCS) software design.

Since 2011, the International Scientific Optical Network (ISON) project started a transition to the new standard TCS software called FORTE (Facility for Operating Robotic Telescopes) that is now in the course of active development and testing (it currently operates about 20 dedicated Roscosmos sensors and several other facilities) and that should gradually replace our previous software throughout the whole ISON to overcome the design flaws of the latter.

The new software has a Python-based distributed client-server architecture that makes it extremely flexible and scalable to a wide range of sensor apertures. A tight integration with Apex package for astronomical image analysis helps to automate the complex calibration and maintenance tasks and provides access to stellar catalogs and orbital data. A customizable high-level object-oriented modular approach allows one to easily configure the package for use in the very peculiar sensor configurations. We describe the basic design principles of FORTE and show in detail how it meets these and other requirements of ground-based optical space surveillance.