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The operational and control software of Multi-channel Antarctic Solar Telescope

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MARST (Multi-channel Antarctic Solar Telescope) aims to observe the Sun in multiple wavebands at Antarctic. It will be the Chinese first Solar telescope in Antarctic. The telescope has two tubes, corresponding to Photosphere observation which uses 11 filters and Chromosphere observation in Hα waveband. We need to coordinate two tubes to observe at the same time. The telescope will observe the Sun for a long time which needs, so we also need a self-guiding module to improve tracking precision. Besides, performing solar specific flat-field exposure is necessary for analyzing. EPICS is introduced to control each hardware and an autonomous observation system based on RTS2 is designed under such demands.

We wrote EPICS application modules is developed for each device: telescope mount & focuser, filter wheel, Hα filter, dome with webcam, Andor CCD and PI CCD. We also integrated EIPCS modules into RTS2 framework with an XML configuration. To control these applications autonomously we developed an rts2 executor module is developed. In the executor, two plan classes are instantiated to control two sets of filters and CCDs, and ensure only one could control the mount at the same time. Different types of plan are designed to describe different series of process with different priority. For example, flat-field plan is performed in higher priority. To improve tracking precision, we calculate centroid of each image to get the offset, then apply the correction to the telescope during observation process.

Minioral

Yes

Description

Multi-channel Antarctic Solar

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