

System normalization of the Taeduk Radio Astronomy Observatory and application plan to the National Youth Space Center in Korea

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The Taeduk Radio astronomy Observatory (TRAO) has installed a new 4X4 receiver system (SEQUOIA-TRAO) (Erickson, N. R., Grosslein, R. M., Erickson, R. B. & Weinreb, S. 1999, IEEE Transactions on Microwave Theory and Techniques, 47, 2212) that covers from 86 GHz to 115 GHz with low system noise temperature (170 K at 100 GHz and 400 K at 115 GHz). There is a intermediate frequency converter with power dividers that two line frequencies can be observed within fixed range simultaneously. A backend is followed to reduce thirty-two intermediate frequencies with Fast Fourier-Transform method.

New hardware and Monitor & Control (M&C) software have developed to manage all the devices and observation methods with VxWorks. It is based on Large Magellan Telescope M&C of Five College Radio Astronomy Observatory (FCRAO) team. The On-The-Fly (OTF) method is applied mainly. An OTF reduction tool is revised from vanished software of FCRAO. Reduction tools, revised SPA of FCRAO and CLASS of GILDAS package are available. In 2016, TRAO has opened three key science projects and eight general projects with high level of satisfactions.

The National Youth Space Center in Korea has set up three 1.8 meters radio interferometry dishes for 12 GHz frequency observation. It is utilized to radio education program for Korean students. Incomplete M&C systems are adopted to manage front-end and back-end devices, separately. There is no radio astronomy observation mode on the programs at all.

We have a plan to migrate the TRAO M&C system to the NYSC interferometry system. The TRAO M&C is based on VxWorks OS, and the NYSC is on Windows. By adopting realtime process on current micro-controller and rewriting other processes on Windows system, the NYSC will have a new M&C system by LabWindows/CVI tool. This operation will has a flexibility that can be applied on other OS system, easily.