A Cryogenic Two Millimeter Reciver System

Chang Hoon Lee, Seog Tae Han, Kwang Dong Kim, In Sung Yim,
Hyo Ryoung Kim, Hyun Soo Chung, Tae Sung Kim
DRAO/Korea Astronomy Observatory

Since we finished the purchasie of the cooled Schottky diode mixer reciever made by Radiometer Physics Co. for the 120-170 GHz in October 1991, we haven't prepared the PLL hardwere and softwere for this recciever and the ellipsoidal mirror beam guiding. After these proglems were solved, this reciever was installed at the 14m terescope in late December 1993, and used for the confirmation of a spectral line detection and the measurement of the beam efficiency is about 36% at 149 GHz. However the LO PLL system of this 2mm reciever has some weak points. There are as following. Fiist, the frequency adjusting is so sensitive becouse the covering frequency of a GUNN oscillator is 62.0 GHz to 86.0 GHz widely.

Second, the state of the frequency locking doesn't stable. So the observation efficiency is lower. Third, we don't read the actual locking frequency under this PLL system. And the tuning procedure is so tedious work.

So the old LO PLL system was changed for other system using the remote sensor, EIP counter and GUNN modulator, and the 2mm reciever system can be installed again in Dec. 1994. The mm wave spectrum between 124 and 161 GHz of the star-forming KL region of Orion has been surveyed with the DRAO 14m telescope at a resolution of 1MHz. And the SiO Survey Project has been carried in winter season of this year.

250kHz 휠터뱅크 제작

김광동, 김효령, 임인성, 김성태, 민영철
천문대

전파망원경 시스템에서 사용되는 분광기로서, 250kHz 분해능의 256 채널 휠터뱅크를 국내 제작하고 있다. 기존의 Millitech Co. 에서 제작된 휠터뱅크를 모델로 삼아, 250 kHz 분해능을 갖는 휠터보드의 각 소자에 대한 특성 측정 및 최적상태의 값들을 얻었다. 새로이 국내 제작되는 휠터뱅크의 기능과 특성의 향상을 위하여, 기존 휠터뱅크의 회로를 분석하여 더욱 향상된 저잡음의 회로를 설계하였다. 새로운 휠터보드를 구성할 각 부품의 최적화된 값을 선택하였고, 향후 휠터뱅크의 다양한 기능을 위하여 듀얼모드의 기능, 카운터 용량의 증가 및 시리즈 기능 등의 향상된 기능과 특성을 갖는 회로설계를 완료하였다.