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TRAO ^{13}CO Outer Galaxy Survey

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Abstract. We have observed the parts of the second quadrant of the Galactic Plane in ^{13}CO(1-0) using the multibeam receiver system installed on the 14 m telescope at Taeduk Radio Astronomy Observatory (TRAO). The first target region A (L=108^o to 112^o.5) is the part of the ^{12}CO Outer Galactic Plane Survey (OGS; Heyer *et al.* 1998), and it is for the exact Galactic plane with the latitude range of +1 and -1 degree. A total of 48,000 spectra (about 9 square degrees) were obtained on 50″ grid. Two following regions were also observed; Region B: L = 120^o $\sim$ 121^o.7, B = -1^o $\sim$ $+1^o$ (38,000 spectra) Region C: L = 130^o 132^o, B = $-1^o\sim$ $+1^o$ (42,000 spectra). Eventually all the regions of the OGS will be covered. The selected velocity resolution is 0.63 km s^{-1} and the covered velocity is 320 km s^{-1}, from $-$210 to 110 km s^{-1}. The typical system temperature is ranging from 400 to 800 K, and average sensitivity per channel is 0.17 K.

We developed a new reduction method, which effectively deals with a relatively noisy 3-dimensional database. After using simple linear baseline subtraction, we mainly used the IRAF *twod.longslit.background* task in 3D within some scripts, as well as IRAF tasks dealing with statistics, and a revised FCRAO reduction package, which is working within IRAF as external user's tasks. The collected ^{13}CO database will be manipulated with pre-existing ^{12}CO data to get several physical parameters. As it is located in the second quadrant, the kinematic distances of the individual clouds, which will be identified, can be estimated straightforwardly without any distance ambiguity. In this meeting we present the reduction method, integrated intensity maps, and spatial-velocity maps. We intend to clarify any difference of their characteristics between the clouds in the Outer Galaxy and Inner Galaxy using our data base.

The present TRAO receiver system has aged, and thus its performance level degraded. However, we have a plan to renovate our receiver system to a brand new one within the next two years. This will speed up the TOGS project. At present, it costs substantial amount of time to homogeneously reduce the spectra obtained with our present receiver system. To compensate this, we invested more integration time, and developed more advanced reduction methods (see above). A future multibeam array receiver system at the TRAO would be at least 16 beams with most recent mixers (T_{sys} $\sim$ 150 K at 110GHz), hopefully.

Keywords. ISM: molecules — surveys

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