日本天文学会早川幸男基金渡航報告書

締切 採択

申請者氏名	**何　晩秋 (会員番号 6744)**
連絡先住所	〒 980-8578 宮城県仙台市青葉区荒巻字青葉 6-3
所属機関	東北大学 大学院理学研究科 天文学専攻
職あるいは学年	D2
任期 (再任昇格条件)	
渡航目的	観測
講演・観測・研究題目	Constraining the clustering of “typical” quasars in the early universe.
渡航先 (期間)	Australia(2018 年 6 月 13 日〜6 月 21 日)

We visited the Siding Spring Observatory in Australia to conduct the optical spectroscopic observation of the $z \sim 4$ low-luminosity quasars selected from the HSC-SSP S16A Wide2 layer with the 2dF-AAOmega mounted on the 3.9m Anglo-Australian Telescope (AAT). Our main purposes are 1) to identify the photometrically selected quasars with low luminosity at $z \sim 4$; 2) to constrain the occupation of the low-luminosity quasars within the halo at $z \sim 4$, i.e., the small-scale clustering. We were allocated with 4 first half nights from Jun.15-18.

On each afternoon, we focused the spectrograph and configured the first field for the night observation, which started around 6:30 pm local time. After focusing the telescope, we started taking the calibration (fibre flat and arc) and science frames following the observation plan. The supporters from Australian side are quite nice people. Before the run, we carefully discussed on our configuration designs through e-mail. After getting the site, they patiently taught us how to do spectrograph/telescope focusing, to configure a field, to check the seeing, and to take the calibration and science frames.

Although we only obtained an exposure time of ~ 3 hours due to the cloudy weather, we still gain valuable scientific results. The preliminary data reduction identified 11 new $20 < i < 22.6$ quasars at $z \sim 3.5$, which are still ~ 2 mag fainter than the SDSS quasars at the epoch. Moreover, we included some radio galaxy/dusty obscured galaxy (DOG) sample from our collaborators in the configuration. Around 20 among them are identified from the emission or absorption lines. We found broad emission lines, which can be cross matched by a quasar template at $z \sim 3.3$, along with a blue continuum for the DOG sample. We will continue working hard on the data. Beyond the scientific results, we took valuable discussions with the Australian astronomers. Since the AAT will not provide astronomy support from the next semester (S18B), we hope our experience in the run can help other astronomers having/applying for the AAT time in Japan. In a word, we gained a lot from the trip and I am greatly indebted to you for all of your support.