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The NAOC Ali Observatory, Tibet

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Abstract. The Ali observatory, NAOC, was established recently on the high plateau in southwest of Tibet, as the result of long-term site survey in western China. This paper briefly reviews the site characteristics of Tibetan site, and introduces the current status of Ali observatory and construction plan in coming years.

1. Site Testing in Tibet

The site survey in western China has been carried out since 2003, in order to identify appropriate sites for constructing large and medium-size telescopes for East-Asian communities[1]. Remote studies and local surveys are performed over the vast land of plateaus in western China[2, 3]. Two candidate sites, called Karasu, on Pamirs, and Oma, on Ali plateau in Tibet, are selected in 2005, and site testing observations have been deployed to make the first phase measurements. Cloud coverage, seeing, and precipitable water vapor(PWV) are taken as the most important parameters to evaluate the sites, and meteorological parameters, sky brightness, as well as ground layer turbulence when available(Sasaki et al., in this proceedings), are also measured.

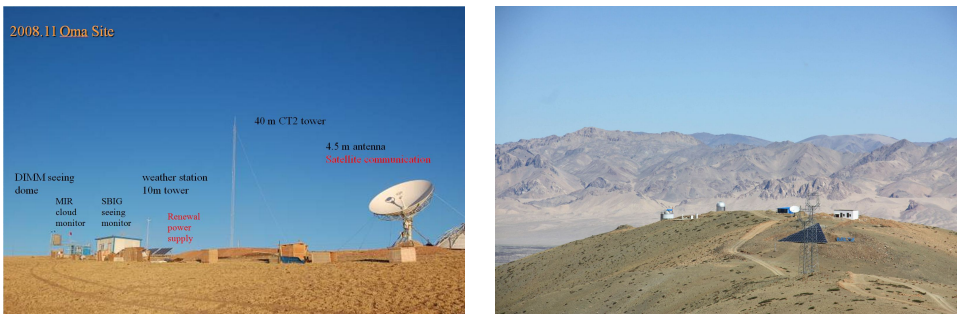

Figure 1. (left)Site testing station at Oma, Tibet; (right)Ali Observatory established in 2010 for site testing and small telescopes.

2. Site Testing Results at Oma

The cloud coverage and meteorological parameters at Oma site are observed totally 906 days in two periods of 2005-2006 and 2008-2010(Fig.1). With strict criteria, the clear rate in daytime is measured to be 56%, and in nightime 68%; the rates of useful days and nights are 72% and 75%, respectively. The mean temperature and the difference at night are measured to be -1.9°C and 3.3°C. The median relative humidity is 30%, and median wind speed 6.4m/s, with rather stable wind directions. The strong wind over 11m/s during nigh occurs only 13%[4].

The PWV is measured by monitoring the optical atmospheric absorption lines of sunlight. The median PWV values are 2.2mm in the 2005-2006 observing period and 1.3mm in the 2008-2010 period, and generally less than 1.0mm in autumn-winter season. The DIMM seeing has been measured typically with 5ms or 10ms exposure; the median seeing is 0.92", with 22% measurements less than 0.8". The median seeing value in autumn season drops to 0.74".

3. The New Ali Observatory

The Ali observatory, NAOC, is located at N32°19'&E80°01', with an altitude of 5100m. The new site has been identified in 2009 and begun construction in 2010, for both site testing and small telescope projects. One of the main advantages of Ali site is near the central town of Ali area, called Shiquanhe, so that the observatory can be easily sustained. The Ali airport is open in 2010, making it possible to fly from Ali to Beijing within one day, or from Beijing to Ali by two days, affording one day acclimation in Lhasa.

The Ali Observatory comes into works in July 2011(Fig.1). There are two domes constructed in October 2010, and 25KW solar power electrical supply and satellite communication antenna are completed in May 2011. There are also electrical power and fiber network lines from Shiquanhe town pass the way on summit to the Ali airport.

Following the site selection process of ELT projects, we have identified Ali area in Tibet as the best for astronomical observations, and will further concentrate more than one year on detailed site characterization. All the related site testing instruments will be installed by October 2011. A Scidar system for turbulence profile(Liu et al. in this proceedings) is planned to make the first on-site run during 2011 autumn-winter season.

The sites such as Ali observatory, with high altitudes over 4000m, could open new avenues for classical astronomy with an extension of the atmospheric window[5]. Our further effort is to make a middle size telescope and related instruments involving infrared and submm wavebands[6].

References

[1] Yao, Y. 2005, J. Korean Astron. Soc., 38, 113
[2] Zhang, Y., et al. 2010, Scentia Sinica Phys, Mech & Astron. 40, 1302
[3] Qian, X., et al. 2011, Scentia Sinica Phys, Mech & Astron. 41, 896
[4] Wang, J., et al. 2008, Astron Res & Tech. 4, 404
[5] Sarazin, M. 2010, *Comprehensive characterization of astronomical sites*, Kislovodsk, Russia
[6] Yao, Y. 2005, J. Korean Astron. Soc., 38, 335