

SOME CENTRAL ASIAN OBSERVATORIES FOR THE WET

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Abstract. The Mt. Maidanak Observatory, one of several observatories in the former Soviet Central Asia, is located at an important longitude to fill in the gap in the WET network. The Lithuanian astronomical station on Mt. Maidanak was successfully tested in May 1992 for future WET campaigns. In the September 1992 campaign it provided some useful data for the WET. In February 1993 the observatory was nationalized by the Uzbekistan government, and almost all astronomical activities there have stopped. The future use of this observatory for the WET campaigns is uncertain, but there are some signs that the situation is improving. We have looked for the possibility to use other Central Asian observatories for the WET. A contact was established with the Fesenkov Astronomical Institute in Alma-Ata, and in October 1993 the WET observations were made at the Assy-Turgen Observatory in Kazakhstan.

Key words: site testing – observatories – telescopes

1. The Maidanak site

Mt. Maidanak Observatory is at $4^{\text{h}}27^{\text{m}}35^{\text{s}}\text{E}$ and $38^{\circ}41'3''\text{N}$, a location which is vital for filling in the gap in the WET lightcurves. This observatory earlier belonged to the Institute of Theoretical Physics and Astronomy in Vilnius, Lithuania.

The location is on Mt. Maidanak (elevation 2540 m), 40 km south of the town of Kitab in Uzbekistan. The nearest larger city is Samarkand – about 100 km away. Samarkand, as well as the town of Shakhrisyabz (near Kitab), can be reached by plane or by bus from

Tashkent. From Kitab it takes 3–4 hours to reach the Observatory along a 150 km long winding mountain road.

The night sky is very good. Only a few scattered lights are seen from the villages and farm houses in the deep valleys below. The horizon in the South and the East is quite dark, but it is brighter in the North and even more in the West, where through a long valley one can observe scattered light from the city of Karshi.

The Lithuanian station has two telescopes, a 1.0 m Carl Zeiss and a 48 cm Grubb Parsons. The 1 m telescope is the largest operating telescope on the mountain.

Near the Lithuanian station there are several telescope domes and buildings which belong to astronomical institutions of Kiev, St. Petersburg and Moscow. Many telescopes are under construction, but progress was very slow because of financial difficulties and unstable political situation. Only two 0.6 m telescopes, one belonging to the Moscow University and the other to the Ukrainian Academy of Sciences, are operational.

About 6 km to the East on the other summit of Mt. Maidanak there are telescope domes and service buildings which belong to the Russian military station for space observations and the Astronomical Institute of Uzbekistan.

2. History

The Lithuanian station was established on Mt. Maidanak in 1976. At the beginning, it was located on the eastern summit. There was a 48 cm reflector with a simple one-channel photometer. The observers lived in a road makers carriage-house, sometimes without heating.

Later on we decided to move onto the other summit, which is 6 km west, at an elevation of 2540 m, where the first buildings of the Moscow Sternberg Astronomical Institute were already built.

In 1978, our Institute bought from Carl Zeiss, Jena a 1 meter Ritchey-Chretien reflector which went into operation in 1981. Also, two living houses, storage buildings and a power station have been built. In the town of Kitab the support station, a lower base living quarter, was built.

The telescopes were used for stellar photometry mostly in the summer and autumn months (from June till November) which have the largest number of clear nights. In winter, the 1 meter telescope was used for spectroscopy and radial velocity measurements.

During the period of Soviet occupation of Lithuania, we had no possibilities to observe at modern free-world observatories, and the majority of our observational data were obtained on Mt. Maidanak. Our main job were observations of the selected galactic areas in the Vilnius photometric system.

3. WET campaigns on Mt. Maidanak

The first idea to use the Maidanak Observatory for the WET purposes came at the Uppsala conference in June 1990, where I met Prof. Jan-Erik Solheim for the first time. He directed my attention to the pulsating white dwarf stars and the WET campaigns.

The first WET expedition to Mt. Maidanak took place at the end of May 1992 and consisted of Prof. Solheim and myself. We were lucky and managed not only to test the new travelling photometer, specially built for this expedition (Meištas & Solheim 1993), but also succeeded in obtaining some useful observations. We also tested the satellite communication equipment to get in contact with the WET headquarters for instructions (Bruvold 1993).

Our intention was to use this station in the summer and fall seasons (May to October), when the WET coverage from India is not so good due to the monsoon season with frequent clouds.

In September 1992, we again participated in a WET campaign. Despite of troubles with the out-of-date telescope electronics, we collected a good amount of data, which, to my great surprise, were accepted in the WET headquarters with an excitement. It appeared, that we filled in some serious gaps in the lightcurves and proved that this site is of great significance for the future WET campaigns. (For more information see Solheim 1993 and Bruvold 1993).

4. The present situation

The Mt. Maidanak Observatory was always hard to maintain for our relatively small Institute. Economical problems became serious even before the collapse of the Soviet Union. It was obvious that the 1 m telescope needs mechanical and electronical repair, but the hiring of specialists and purchase of replacement parts were too expensive for us.

And what's more, in February 1993 the President of Uzbekistan issued an order to nationalize all the instrumentation and buildings on Mt. Maidanak as well as at the Kitab support station. All

astronomers and technicians were forced to leave the Observatory. After that the use of the telescopes stopped and the future of the Observatory has become uncertain. Negotiations to restore the Lithuanian property gave no results. The same situation exists for the property of Moscow, St. Petersburg, Kiev and Estonian institutions.

Recently, an agreement has been reached to establish an International Astronomical Observatory on Mt. Maidanak with participation of Uzbekistan, Russia, Ukraine and Lithuania. However, there are serious doubts as to whether it will be possible to maintain the Observatory in working condition in the present unstable political and economical situation. The future use of Mt. Maidanak for WET campaigns is still uncertain, but we hope the situation may improve in the future.

5. Other Central Asian observatories

Because of the problems on Mt. Maidanak, we investigated three other observatories in the same Central Asian region, which could be used for the WET purposes.

5.1. Sanglok Observatory, Tajikistan.

This observatory belongs to Tajikistan Academy of Sciences. It is situated about 200 km from the Afganistan border, to the South East from the capital city Dushanbe, on a ~ 2600 m summit.

The horizons are mostly open, but to the South there is a big valley-plain with villages and lots of scattered but not too bright lights. The site could marginally fit for the WET purposes.

The main telescope at Sanglok is a 1 m Zeiss, of the same type as our 1 m telescope, for which the travelling photometer is constructed. They have permanent electric supply, good living quarters and a lot of space for laboratories in the four story telescope tower. However, the political situation in this area is very unstable. Now Tajikistan is in a state of civil war, and we have lost contacts with the local astronomers.

5.2. Tien-Shan Observatory, Kazakhstan.

This observatory belongs to the Sternberg Astronomical Institute in Moscow. It is situated ~ 60 km to the South from Alma-Ata

in a 2800 m elevation valley with mountains nearby, reaching up to 4500 m altitude.

The horizon at this observatory is rather high (South 17° , West 11°), but the local astronomers claim they have a very stable extinction, which fits exceptionally good for absolute photometry. Their best observing season is in fall and winter, when the ground is covered by snow. They have two 1 m Zeiss telescopes, an almost finished 80 cm telescope, permanent electric power and very good living and working conditions. At the moment, the activities at the observatory are low due to financial problems in Russia.

This site is of limited interest for the WET, because of the high horizon and bright sky, lighted by the nearby Alma-Ata city. However, the personnel is very interested in collaboration with us, and the place could be used for observations outside WET campaigns, and also in WET campaigns if shorter than usual coverage were acceptable.

5.3. Assy-Turgen Observatory, Kazakhstan.

This observatory belongs to the Fesenkov Astronomical Institute, Kazakhstan Academy of Sciences. It is situated on the 2665 m Tien-Shan mountain plain, ~ 150 km to the East from Alma-Ata. The last 20 km of the road are very difficult to drive, especially in the wet seasons of autumn and spring.

The horizon is open in all directions, in the West it is at -5° . The sky is very dark with no disturbing lights anywhere. The site fits astronomically very well for the WET purposes. The observatory owns a 1 m Zeiss telescope in good condition, except for very bad tracking due to poor polar alignment (several earthquakes have shifted the polar axis). They also have a 1.5 m Russian-made telescope under halted construction in a senselessly high tower, with little hopes to finish it in the nearest future.

However, living and working conditions are not easy there. There is no permanent electricity and the Diesel-generator runs only for a limited time, saving fuel for observations. The fuel is not only difficult to purchase, but also problematic to get delivered. There is no telephone connection with the outside world, and regular WET communication must depend on our own satellite communication.

6. The WET at Assy-Turgen

When astronomy on Mt. Maidanak was stopped, we investigated the other Central Asian sites for the approaching WET campaign in October 1993. It became obvious that the best choice was to try the Assy-Turgen Observatory.

J.-E. Solheim and myself contacted astronomers at the Kazakhstan Fesenkov Astronomical Institute and we were invited to observe at Assy-Turgen. There we found at least two experienced astronomers-observers, V. Kardapolov and F. Rspaev, who were ready to join the WET project. They worked with us and helped us in all possible ways, during our observational run.

Before leaving, we discussed possibilities for our future collaboration and we were granted telescope time at the Assy-Turgen Observatory at least for the next May 1994 campaign. It seems, that Assy-Turgen could be a permanent WET site, but those of us who are going to work there should be ready for rather tough living conditions.

7. Conclusions

We have investigated observing possibilities in Central Asia for the WET. Due to difficult and changing political situation and economic constraints, the use of these observatories requires special planning and some caution. For the time being, we recommend the Assy-Turgen Observatory as the best place for the WET campaigns.

References

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