OBSERVATION OF OCTOBER DRACONIDS 2011 IN MAIDANAK OBSERVATORY AND STUDY OF ITS PEAK TIME M. Sato[1], J. Watanabe[2], and T. Ohkawa[3], [1] Kawasaki Municipal Science Museum (Masugata 7-1-2, Tamaku, Kawasaki, Kanagawa, 214-0032, Japan, sato@kaicho.net), [2] National Astronomical Observatory of Japan (2-21-1 Osawa, Mitaka, Tokyo, 181-8588, Japan, jun.watanabe@nao.ac.jp), [3] National Astronomical Observatory of Japan (2-21-1 Osawa, Mitaka, Tokyo, 181-8588, Japan, ohkawa00@starhax.com).

Introduction: October Draconids is one of the established meteor shower (IAU No.9). The parent body is 21P/Gicacobini-Zinner discovered in 1900. In the past, several great meteor storms and outbursts were observed. For example, the estimated values of ZHR were about 10,000 both in 1933 and 1946, while they were between about 500 and 1,000 both in 1985 and 1998.

It was thought that the prediction of the October Draconids was difficult before the application of the dust trail theory was established. However, the past appearances were elucidated by this method [1] [2].

In 2011, the outburst of the October Draconids was forecasted on October 8 [2] [3] [4] [5].

The main peak, we named 2nd peak, was predicted around 20h (UT) and the sub-peak, we named 1st peak, was predicted around 17h (UT) on Octorber 8. The main peak was caused by a dust trail which was formed by meteoroids ejected from the parent body in 1900. The peak would be certainly expected because the dust trail which caused this peak was formed after the discovery of the parent comet. And the condition of its density of meteoroids was so favorable for a meteor outburst.

On the other hand, the sub-peak was uncertain because the dust trail for this peak was formed before the discovery of the parent body. For example, meteoroids were ejected in 1883. However, if the sub-peak is detected, it shows the evidence of active ejection from the parent comet before its discovery. Hence, we set that a purpose was to detect the sub-peak and we decided to observe it in the area of Central Asia because a condition was favorable for observing the sub-peak. Moreober, we could observe the main peak and a good weather was expected there.

Observation: We observed at Maidanak Observatory in Uzbekistan, where the longitude is 66d 54' 0.5"E, the latitude is +38d 40' 26.6" , and the 2600m above the sea level.

We carried out a video observation by using high sensitivity monochrome cameras. We used WATEC Neptune100 with 6mm lens for the observation instrument.

We also performed a visual observation as a standard method for meteor observations as a complimentary method.

Result: The main peak (2nd peak) was obviously detected around 20h (UT) by a video observation and a visual observation. Its time was almost corresponding to the results collected by IMO [6].

On the other hand, the sub-peak (1st peak) was not clear because a weather condition was not so good, sometimes clouds came. However, the appearance of the Draconids began at 15h (UT). Its time was before the expected sub-peak, and it was very early for the main peak. Moreover, the appearance continued until the expected time of the sub-peak. Hence, this activity was thought to be due to the sub-peak.

Discussion: The time of the main peak was predicted at 20h36m (UT) by Sato, one of authors [3]. The difference between the predicted peak and the observed peak time was about a half hour, it was slightly large. Then, the method of a prediction was examined again in detail. As a result, it became clear that the process of deriving the epoch with using orbital elements had an error. The corrected peak time was about 20h09m (UT) and it was almost matched the actual peak time of observations [7]. We also study other peaks of the Draconids in 2011.

References: [1] M. Sato (2003) WGN (Journal of IMO), 31, 59-63. [2] J. Watanabe and M. Sato, EM&P, 102, 111-116. [3] J. Vaubaillon et al. (2011) WGN (Journal of IMO), 39, 59-63. [4] M. Maslov (2011) WGN (Journal of IMO), 39, 64-67. [5] J. Vaubaillon et al. (2011) CBET, 2819. [6] IMO (2011), web, http://www.imo.net/live/draconids2011/. [7] M. Sato (2012) the Bulletin of the Kawasaki Municipal Science Museum, in print (in Japanese).