Development of the highly precise high-speed photometry technique with the photometer mounted with PIRKA telescope

*Nami Kimura[1]

1. Hokkaido University

There is a few striped pattern on Jupiter when we observe by visible light, and we can see white bands called " belt” and dark band called " zone". The cloud top altitude is high at zone, low at belt by infrared observation.Various models are proposed to figure out, but we cannot elucidate the mechanism of this large scale structure.The Galileo datas tell us that the zonal jets are located on boundaries between the belts and zones, with the westward jets on the poleward edges of belts and the eastward jets on the poleward edges of zones.It is still not clear that the wind occurs by sun light in atmospheric layer or internal heat source makes the global structure including the wind.One of the mechanism making zonal wind is that small eddies combine each other and make eddy flow, but it is not sufficiently to observe the cumulonimbus the source of small eddies. In the case of thunders of the earth, the study of the activity of cumulonimbus such a strong upward current and thunder storms makes progress. Upward current can help hydrologic cycle. There is a relationship of frequency of thunders and the altitude go the cumulonimbus on the earth, and the CMC is known to be proportion to brightness of the thunder, too. I developed a photometer equipped to PIRKA telescope to arrest the time change and the frequency of thunder lightning in the Jupiter.First I estimated the time of the duration and freqency and spatial distribution of lightnings of Jupiter by using parameters of lightnings on the earth and observation data of satellites.Then it is necessary to divide into 10 to observe lightning activity which continue 1ms and to focus on one cumulonimbus and to get high signal-noise ratio. I designed the equipment which can achieve these numerical goal and examined observation methods for example exposure time and field of view.

