

S16c The discovery of a candidate of a quasar with periodic UV/optical variability

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Quasars are thought to have supermassive blackholes at their center and to form accretion disks around those. One of the most important properties of quasars is their flux variability, however, the cause of which is still under debate. Generally, the flux variability of quasars is random, but in 2015, a quasar with periodic variability was discovered. Recently, more than 130 candidates have been identified by Guo et al. Although the reason for such periodic variations is not well understood, the rotation of supermassive black hole binaries is one of the most promising candidates.

It is important to study the periodic flux variation in detail, since it has the potential to elucidate the intermediate stages in the evolution of quasars. Using the Catalina realtime transient survey (CRTS) catalog and the archival data of PanSTARRS, we identified one candidate source (WISE J0909) other than the sample of Guo et al. that exhibited the periodic variability (total: 1.8 periods, 5 years per period, amplitude: 0.06 mag). Apart from the archival data, we had performed simultaneous three-color observations in the g' , R_c , and I_c bands using the 105 cm Murikabushi telescope/MITSuME in Ishigakijima Observatory for a year. The results are consistent with the expectation that the recent years are in the diminishing phase based on the fitting with the sinusoidal function. Since the SED of this candidate is known to be very red, it may be possible to discuss the connection between galaxy interactions and black hole binaries.