

[구ST-01] Follow-up Observations of Transiting Planets using Heavy Defocus Technique

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We have carried out follow-up observations of transiting extrasolar planets using small- to medium-sized reflectors located in Korea. Using the 0.60m telescope stationed at CbNUO (Chungbuk National University Observatory) we have achieved a photometric precision of 1.48 milli-magnitudes (root-mean-square scatter of data) of a HAT-P-09b (transit duration of 3.43 hrs) transit light curve (transit depth $\sim 1.3\%$) with $V=12.3$ mag for the host star. We expect a photometric precision of 1.0 - 1.2 milli-magnitude for brighter targets ($V \sim 10 - 11$ mag). The transit technique and its application will be outlined. The results of test observations will be presented and the defocus technique will be discussed.

[구ST-02] Neutron star binaries as gravitational wave sources

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Compact binaries are important sources of gravitational waves. They are also prime targets for long baseline laser interferometers. In this talk, we present latest progresses made in the Galactic merger rate calculations for compact binaries in the Galactic disk, with an emphasis on NS-NS binaries. For the first time, the non-recycled pulsar found in the Double Pulsar system (PSR J0737-3039B) is included in the rate calculation. We then discuss the prospects of detecting gravitational waves for Earth-based detectors such as advanced LIGO (Laser Interferometer Gravitational-wave Observatory) in US and advanced Virgo in Europe, extrapolating the Galactic rate estimates up to the detection volume of the advanced LIGO-Virgo network. Our results support the expectation that gravitational waves emitted from compact binary mergers will be detected within a decade. However, the detection rate of gravitational waves associated with NS-NS mergers is most likely to be several per year that is much smaller than what has been previously known.