study.

[포 ST-04] PLANETARY CAUSTIC PERTURBATIONS OF A CLOSE-SEPARATION PLANET ON MICROLENSING

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We investigate the properties and detection conditions for the planetary caustic perturbation of close-separation planets. To find the properties of the planetary caustic perturbation, we construct deviation maps by subtracting the single-lensing magnification of the lens star from the planetary lensing magnification for various lensing parameters. We find that each deviation area of the positive and negative perturbations disappears at the same normalized source radius according to a given deviation threshold regardless of mass ratio but disappears at a different normalized source radius according to the separation. We also estimate the upper limit of the normalized source radius to detect the planetary caustic perturbation. We find simple relations between the upper limit of the normalized source radius and the lensing parameters. From the relations, we obtain an analytic condition for the detection limit of the planet, and which show that we can sufficiently discover a planet with the mass of sub-Earth for typical microlensing events. Therefore, we expect to add the number of low-mass planets in the next-generation microlensing experiments and conclude that our detection condition of the planet can be used as a important criteria for maximal planet detections considering the source type and the photometric accuracy.

[포 ST-05] The Chemical Abundances of Hypervelocity Stars in the Milky Way Disk

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We present preliminary results of the analysis of chemical abundances for seven hypervelocity star (HVS) candidates. These objects are G and K dwarfs in the Galactic disk selected from the Sloan Extension for Galactic Understanding and Exploration. Unlike other HVSs discovered thus far, their stellar orbits and kinematics suggest that they do not originate in the Galactic center or in an accretion event. These factors imply yet-unknown mechanisms that give rise to these kinematically-extreme disk stars. In order to study in detail their progenitors and possible formation mechanisms, we obtained spectra of these stars at a resolving power of R~6000, with the Dual Imaging Spectrograph at the Apache Point Observatory. We derive the abundances of chemical elements, C, Mg, Ca, Ti, Cr, Fe, and Ba from the observed spectra, using MOOG. We compare them with the ones of typical Galactic disk stars and discuss discrepancies between them to search for clues to their origin.

[포 ST-06] It is surface gravity.

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In our previous study, we showed that the peculiar globular cluster M22 contains two distinct stellar populations with different physical properties, having different chemical compositions, spatial distributions and kinematics. We proposed that M22 is most likely formed via a merger of two GCs with heterogeneous metallicities in a dwarf galaxy environment and accreted later to our Galaxy. In their recent study, Mucciarelli et al. claimed that M22 is a normal mono-metallic globular cluster without any perceptible metallicity spread among the two groups of stars, which challenges our results and those of others. We devise new strategies for the local thermodynamic equilibrium abundance analysis of red giant branch stars in globuar clusters and show there exists a spread in the iron abundance distribution in M22.

[포 ST-07] Evolution of primary stars in Pop III binary systems

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Binary interactions may have significant impact on Pop III stellar evolution. Pop III single star evolution indicates that for primary masses less than 20$M_{\odot}$, no significant binary mass transfer