[박EP-01] Detailed Abundance Analysis for Plant Host Stars

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We obtained the spectra of 93 Planet host stars and 73 normal field stars in F, G, K type using BOES at BOAO. We measured the equivalent width of Fe and 25 elements lines using the automatic EW measurement program, TAME(Tools for Automatic Measurement of Equivalent-widths) and estimated the elemental abundances by synth and abfind driver of MOOG code. Since the absence of planets in the normal field stars cannot be "completely" proved, this work focused on the chemical abundances and planet properties of planet host stars, which have the massive planets close to the parent star relatively. We carried out an investigation for the difference of abundances between stars with "Hot Jupiter" and normal field stars with no known planets. We examined the chemical composition of 25 elements, such as C, N, O, S, Na, Mg, Al, Si, K, Ca, Sc, Ti, V, Cr, Mn, Co, Ni, Cu, Zn, Sr, Y, Zr, Ba, Ce, Nd, and Eu by EW measurements, and the S abundances were estimated using synthetic spectrum.

We have found that [Mg/Fe] and [Al/Fe] for planet host stars have lower limit comparing with those of comparison stars, and [Ca/Fe] of host star with Neptunian planets is relatively lower than the other host stars with massive planets. We have performed the Kolmogorov-Smirnov test, and examined the ratio of planet host stars to all stars for each bin of [X/H]. As a result, we noted that the O, Si, and Ca abfor undances are strongly related with the presence of planets.

[구EP-02] 3-D Optical Earth System Model Construction and Disk Averaged Spectral Simulation for Habitable Earth-like Exoplanet

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The Kepler(NASA) and CoRoT(ESA) space telescopes are surveying thousands of exoplanet for finding Earth-like exoplanets with similar environments of the Earth. Then the TPF(NASA), DARWIN(ESA) and many large-aperture ground telescopes have plan for spectroscopic observations of these earth-like exoplanets in next decades. Now, it has been started to simulate the disk averaged spectra of the earthlike exoplanets for comparing the observed spectra and suggesting solutions of environment of these planets. Previous research, the simulations are based on radiative transfer method, but these are limited by optical models of Earth system and instruments. We introduce a new simulation method, IRT(Integrated Ray Tracing) to overcome limitations of previous method. The 3 components are defined in IRT; 1)Sun model, 2)Earth system model (Atmosphere, Land and Ocean), 3)Instrument model. The ray tracing in IRT is simulated in composed 3D real scale space from inside the sun model to the detector of instrument. The Sun model has hemisphere structure with Lambertian scattering optical model. Atmosphere is composed of 16 distributed structures and each optical model includes BSDF with using 6SV radiative transfer code. Coastline and 5 kinds of vegetation distribution data are used to land model structure, and its non-Lambertian scattering optical model is defined with the semi-empirical "parametric kernel method" used for MODIS(NASA) and POLDER(CNES) missions. The ocean model includes sea ice cap structure with the monthly sea ice area variation, and sea water optical model which is considering non-lambertian sun-glint scattering. Computation of spectral imaging and radiative transfer performance of Earth system model is tested with hypothetical space instrument in IRT model. Then we calculated the disk averaged spectra of the Earth system model in IRT computation model for 8 cases; 4 viewing orientation cases with full illuminated phase, and 4 illuminated phase cases in a viewing orientation. Finally the DAS results are compared with previous researching results of radiative transfer method.