

Doppler planet searches targeting stars in solar neighborhood

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A precise Doppler measurement is one of the powerful techniques to detect planets orbiting stars. The technique is applicable to the detection of planets with a wide range of orbital parameters, such as semimajor axis and eccentricity, mass, and host stars. The planets detected by the Doppler surveys can thus help us to gain a general understanding of planet formation and evolution. Furthermore, given the high detection efficiency of planets of the Doppler technique compared to transit ones, it is highly useful to search for planets around stars in solar neighborhood.

We have been conducting Doppler planets searches for planets around nearby giant stars, that is evolved intermediate-mass stars, for about 20 years with 188cm telescope and High Dispersion Echelle Spectrograph (HIDES) of Okayama observatory. We have also started intensive Doppler monitoring of nearby bright solar-type stars at Okayama aiming to explore low-mass planets in their habitable zones. Thanks to refurbishment of the HIDES last year, we can now achieve a Doppler precision better than 1 m/s. In this February, a new planet search program targeting nearby low-mass M-type dwarfs was launched with use of the new InfraRed Doppler instrument (IRD) of Subaru 8.2m telescope. The program aims at detecting earth-mass planets in their habitable zones as well as uncovering population of planets around them. Here we report the latest results from these planet-search programs and discuss future prospects.

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