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Presentation

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The Transit Timing Variation and Atmosphere of WASP-43 b

We perform transit timing variation (TTV) and transmission spectroscopy analyses of the planet WASP-43 b, which is a hot Jupiter exoplanet with an ultrashort orbital period 0.81347753 ± 0.0000007 day. Ninety-three transit light curves are obtained from the VizieR database and the observation from National Astronomical Research Institute of Thailand (NARIT)'s telescopes. We combine the mid transit time from our data with 53 published mid transit time of WASP-43 b. The result shows that WASP-43 b has an orbital period change with the rate $dP/dE = +10.0 \pm 2.1$ milliseconds per year. The TTV analysis shows a possibility that the system has an additional planet that induced the TTVs amplitude signal of 0.000638 ± 0.000081 days. If the body is located near the 1:2 mean-motion resonance orbit, the sinusoidal TTV signal could be caused by the gravitational interaction of 0.0478 ME. For the transmission spectroscopy analysis of WASP-43 b, the transit depths of twenty-seven filters are modelled by the PLATON fitting model. The model shows that the planet has a radius of 1.10 RJ with temperature 1724 K, Scatter factor of 8.92. The metallicity of the planet's atmosphere is 16.59 times that of the Sun. The C/O ratio in the WASP-43b atmosphere is 0.96.

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