

The study of chemical composition of star HD37018 in Orion constellation

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Abstract

This study is about the chemical composition of HD37018. The spectra of HD37018 was analyzed by Audella software and calibrated by The NIST Atomic Spectra Database Lines. From the result the software to find out obtained values about 63.25 km/s which mean the star is moving away from earth.

Method

1. Take the photos of the spectrum of star HD37018 by a Planewave Telescope and collect data by an Eshel Spectrograph at The Regional Observatory for the public Nakhorn Ratchasima – NARIT
2. Take photos of the spectrum of Tungsten (W) & Thallium (Tl) use them as reference images
3. The wavelength of the study. Discover more data using the process REDSHIFT

From

$$z = \left(\frac{\lambda - \lambda_0}{\lambda_0} \right) \quad \text{and} \quad z \approx \frac{v}{c} \quad ; \quad z = \text{Redshift}$$

v	= radial velocity	km/s
λ	= Wavelengths obtained from the study	nm
λ_0	= Standard wavelength	nm
c	= speed of light	(3×10^8 m/s)

Results and Discussions

The obtain line spectrum of HD37018 was calibrated using standard wavelength of Tungsten & Thallium to obtain a chemical composition including 3He-I, H-alpha, He-I and Fe-I. Then, the method of measuring tiny differed between object and standard is wavelength was applied to acquire radial velocity values of each spectral line as showed in Table 1

Table 1 : The table shows the data obtained from the spectral analysis of the star HD37018

point	Wavelengths obtained from the study (nm)	Standard wavelength (nm)	Elements found	Wavelength difference (nm)	radial velocity HD37018 (km/s)	Redshift – Blueshift
1	668.17	668.02	3He-I	0.15	67.36	Redshift
2	656.40	656.27	H-alpha	0.13	59.42	Redshift
3	492.17	492.06	He-I	0.11	67.06	Redshift
4	587.69	587.56	He-I	0.13	66.37	Redshift
5	589.63	589.50	Fe-I	0.13	66.15	Redshift
6	589.04	588.93	Fe-I	0.11	56.03	Redshift
7	447.23	447.14	He-I	0.09	60.37	Redshift
Average				0.12	63.25	Redshift

Conclusion

The chemical composition of HD37018 star including H-alpha, 3He-I, He-I, and heavy elements, Fe-I is a component from wavelength analyzed. According to the theory, a star originated from The combination of molecular clouds which hydrogen is the main component and helium is a secondary component. For HD37018 star also composed some heavier element and it is moving away from earth about 63.25 km/s.

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