Contribution ID: **28** Type: **not specified**

Study of the Lithium abundance in solar-type stars

Tuesday 25 October 2022 11:40 (15 minutes)

In this work, we consider the origin of the chemical element lithium (Li) in the Universe, and calculate its abundance in six solar-type stars.

Li is a very light, soft alkali metal. This is a special element, because it is one of the three elements created during the Big Bang. With the evolution of stars, lithium is modified by the process of nucleosynthesis inside and becomes hardly noticeable.

The evolution of the abundance of lithium in the atmospheres of stars of late spectral types is the subject of numerous studies. Among others, there is the problem of low abundance of Li in the solar atmosphere, which cannot be explained by the existing theories of stellar evolution. On the other hand, a relatively large amount of lithium is observed in the atmospheres of a number of solar-type stars, which also requires explanation.

High-quality observational spectra of just such stars that were used in this work were obtained with the HARPS ESO spectrograph.

The method of synthetic spectra was used in the work. We calculated the theoretical spectrum of stars using a Fortran program. Python programs were also written to adequately compare the theoretical line profiles with the observational spectrum (convolution with the instrumental profile and the stellar rotation profile).

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Session Classification: Stellar astrophysics and interstellar medium