

Abstract

The S 235 A-B region is a zone of star formation, which contains an embedded cluster of young and forming stars. In such clusters, massive stars which trigger further formation of stars are of particular interest.

The purpose of this work lies in the determination of the nature of the nebulae S 235 A and S 235 B and their central stars, since nebulae are often arise due to massive stars. The analysis was carried out using spectroscopic data received on the 6-m BTA telescope of the Special Astrophysical Observatory of the Russian Academy of Sciences.

Electron density in different parts of the nebulae S 235 A is determined in this work. It is determined that the fragmented appearance of the nebula is caused by absorbing material. It is shown that both stars in this nebula are of an early spectral type, and that one of them is likely an accreting star. A scenario for the structure and development of S 235 A is constructed on this basis of these and previous observations.

Furthermore, it is shown that the S 235 B nebulosity is purely reflective, without any intrinsic radiation. The illuminating source is the star S 235 B \star . The spectral class of this star is determined from the spectroscopic data. It is shown that this star is a Herbig Be accreting star with spectral type B1V. The large equivalent width of the H α line in the spectrum of S 235 B \star indicates that this star is exceptionally young.

On the basis of all these results, it is concluded that the traditional understanding of the formation of stars in the center of a collapsing progenitor cloud is unable to explain the arrangement of massive stars in this cluster.

Approbation

The results for the S 235 B object were published in the proceedings of the 38th conference for students “Physics of the Universe” [26], which was held at Kourovka in 2009. An article on the same material has been accepted for publication in the journal *Monthly Notices of the Royal Astronomical Society*.