1. Introduction

HD 150136 is one of the two bright stars separated by 10° and hosted in the centre of the young open cluster NGC 6250 in the Ara OB1 association. This object is clearly an early O-type star first classified as O5 in the bright star catalog. Nielsen & Gamen (2005, MNRAS, 356, 974) reported on the binarity of HD 15136 and classified the system as O3V. They suggested a distance of 360±60 pc. An estimated distance is about 1.32 kpc (Herbst & Hawley, 1977, A&AS, 30, 279). Moreover, Mahy et al. (2012, A&A, 540, A47) determined that the He I line in the spectrum of HD 15136 was evolving to the red. Meanwhile, Mahy et al. (2012) revisited the period in 2.6745±1 d and the classification to O5V+(O3V)+O5V+(P, S). The corresponding lines being rather broad, Mahy et al. reported a colliding wind radial velocity (RV) curve with a presumably fixed value for the centre-of-mass radial velocity. The third object is a unique opportunity to displace the emitting region in the outer system. The shock region is slightly extended and partly occulted. This interpretation agrees with the theoretical model of the system which the authors refer to in the conclusion of the system where the inclination of the system is also presented.

2. Interest of HD 150136

On the basis of Chandra X-ray observations, Skinner et al. (2005, MNRAS, 361, 191) reported that HD 15136 is one of the X-ray brightest early-type stars (log $f_X = 33.99$ (erg s$^{-1}$ cm$^{-2}$)). The emission is attributed to a presumably fixed value for the centre-of-mass radial velocity. Figure 1 shows the corresponding RV curve with the systemic velocity fixed at 25.7454±1 kpc, being rather broad. The dispersion is smaller for the latter figure. Mahy et al. (2012) demonstrated that at a distance of 1.32 kpc, the projection of this object on the sky plane could be disentangled from the other components using modern interferometric facilities. We continued to monitor the spectral variations of the system and we definitively proved that this star has a period around 3000 d and an eccentricity in excess of 0.6 (Sana et al. 2013, A&A, 553, A131). The most complete radial velocity curve is given in Figure 2.

3. The X-ray lightcurve

The variability in the X-ray domain reported by Skinner et al. (2005) is visible in Figure 3 where we exhibit the lightcurve in count rate as a function of the phase of the inner system (see Figure 1). With the new epheeras, the minimum of emission is found at phase zero, i.e. at conjunction with the primary in front of the secondary. This allows to consider the detection of a fainter object in the open cluster with a period of P = 395.7 d. This object is a very interesting object that deserves that we study its nature. The total orbit will be covered within 3 years. The next periastron occurs in 2015.

4. Interferometric observations

4.1 First results (published in Sana et al. 2013)

Since the separation of the Primary+Secondary and Tertiary in the outer system should project on the sky plan with an apparent separation of a very few tens of milliarcsec, we decided to observe this star in interferometric mode. In addition, the star was a target of the ESO Large Program of Sana et al. on the probability of binarity among massive stars. Therefore, we tried to detect the astrometric variations of the outer system. The simultaneous knowledge of the outer orbit RV variations and of the corresponding astrometric orbit will give access to the inclination of the outer orbit and absolute masses both for the total P+S inner system, and for the tertiary object T. From the RV solution of the inner system, we have a precise mass for PS. Therefore, we will subsequently determine the absolute masses and the inclination of the inner system.

HD 150136 has been observed with the VLTI made of four auxiliary telescopes (ATs) located in a configuration A1-G1-K1-H1. The pattern provides six projected baselines ranging from 30 to 120 m. The four signals were combined with PIONIER (Le Bouquin et al. 2011, A&A, 533, A67). First observation took place in June 2011 and has been confirmed by an additional one in August 2012. At both dates, HD 150136 appears as a binary system (as expected) with the assumed tertiary object situated some 9 milliarcsec southwest relative to the inner system that obviously remains unresolved. The positions are given in Table 1 (columns 3 and 6). The separation at a supposed distance of 1.32 kpc corresponds to 12.4 k. The detection of such a companion by classical astrometry is not possible. In the framework of the BELGIAN VEGAII guaranteed time on ATs, the position of the outer system will be monitored using the new stellar coordinates. The agreement with the expected masses from the Mahy et al. calibration on the basis of C Mormède computations is very good. The concordance of these masses with the evolutionary masses deduced from the position is the HR diagram is a strong indication that the outer system orbit for the massive objects is smaller than the others.

4.2 2013 new results

The HD 150136 system was again observed twice in March/April 2013 (see Table 1, columns 5 and 6) in the framework of the Belgian VEGAII guaranteed time on ATs. Figure 4 illustrates the reduction of the data for one of the observations. The object is still clearly present in the SW of the inner system. However it has moved (see Table 1 and Figure 5). Therefore, the new measurements confirm (if necessary) the presence of an object close to the inner system. More importantly, the latter has moved by several degrees in anomaly and this definitively demonstrates that the object is fully associated in the tertiary discovered through the RV solution. These observations are in agreement with an independent measurement by Sanchez-Bermudez et al. (2013, arXiv:1308.2351). The star was again observed in May 2013 with the V1 (Table 1, column 7). The positions given by the 2013 observation are well located on the expected astrometric orbit. The agreement for the location and the outer system orbit for the massive objects is smaller than the others.

Table 1. Results of the first observations of HD 150136 performed with the VLTI (V1+V2+V3+V4) in the framework of the BELGIAN VEGAII guaranteed time on ATs (see also Martins et al. 2012, A&A, 539, A20). Details are available in Sana et al. (2013).

The new measurements have a higher impact than those which are decreased by some 10-15 percent when compared to the preliminary results of Sana et al. (2013).