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Exploring OB Stars in Gaia DR2

ABSTRACT

In this work, we present the new catalog of OB stars from the Gaia DR2 catalog.From Gaia DR2, through a series of methods, the OB stars inside are picked out to build the largest OB catalogue in the world.

1. INTRODUCTION

First we download the sample from Gaia's official website, then we cross the OB stars found in Lamost's work. Then we place the OB stars crossed on the sample downloaded from Gaia and cut the sample along the extinction direction.

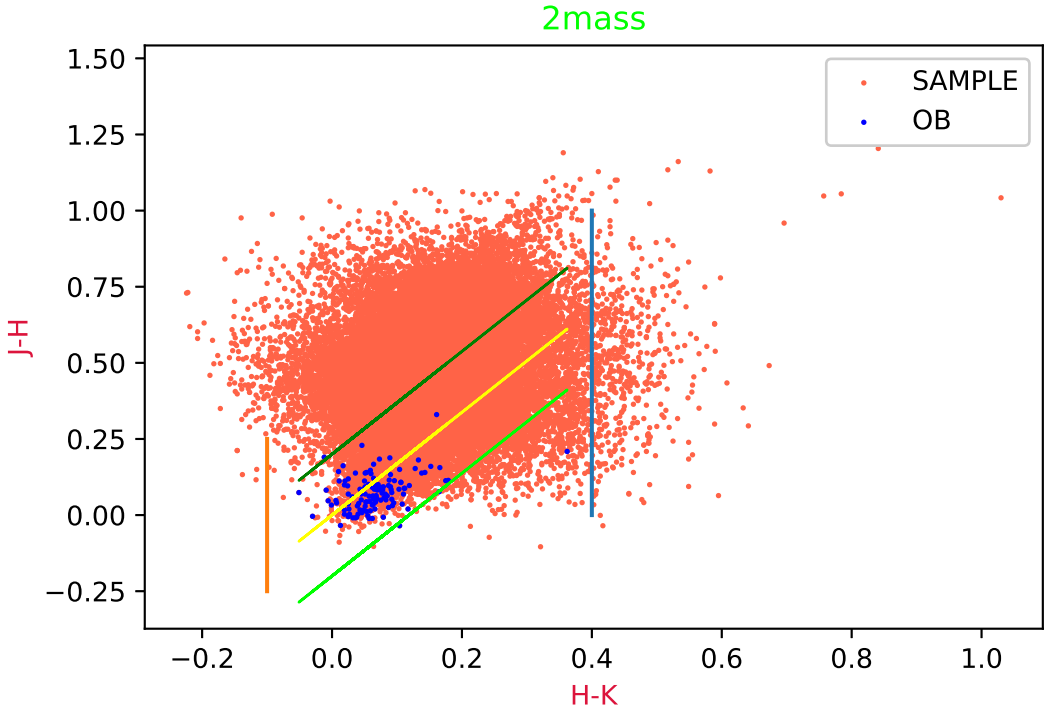

*figure*1.

[]In this diagram, we put the known OB stars found in LAMOST work on the samples downloaded from Gaia. The blue ones are known OB stars and the red ones are samples. endfigure

2. THE REDUCED PROPER MOTION

Hence, we identify the possible dwarf stars from the reduced proper motion. where H is the reduced proper motion, K is the K-band photometry from the 2MASS catalog, m a and m d are the proper motion in milli-arcseconds per year from the PPMXL catalog (Roeser et al. 2010). Because most of the stars in the Milky Way have relatively similar motion speed, then the transversal angular velocity, i.e., the proper motion, is generally larger (smaller) when the star is nearer (farther) to the Sun. Consequently, the proper motion can be very roughly considered as the proxy of the parallax and thus H can be roughly treated as the absolute magnitude of a star. *figure*2.

[]In this picture, the abscissa is J-K and the ordinate is H. endfigure

*figure*3.

[]In this picture, the abscissa is bp-rp and the ordinate is H.

3. FURTHER CUTTING SAMPLES

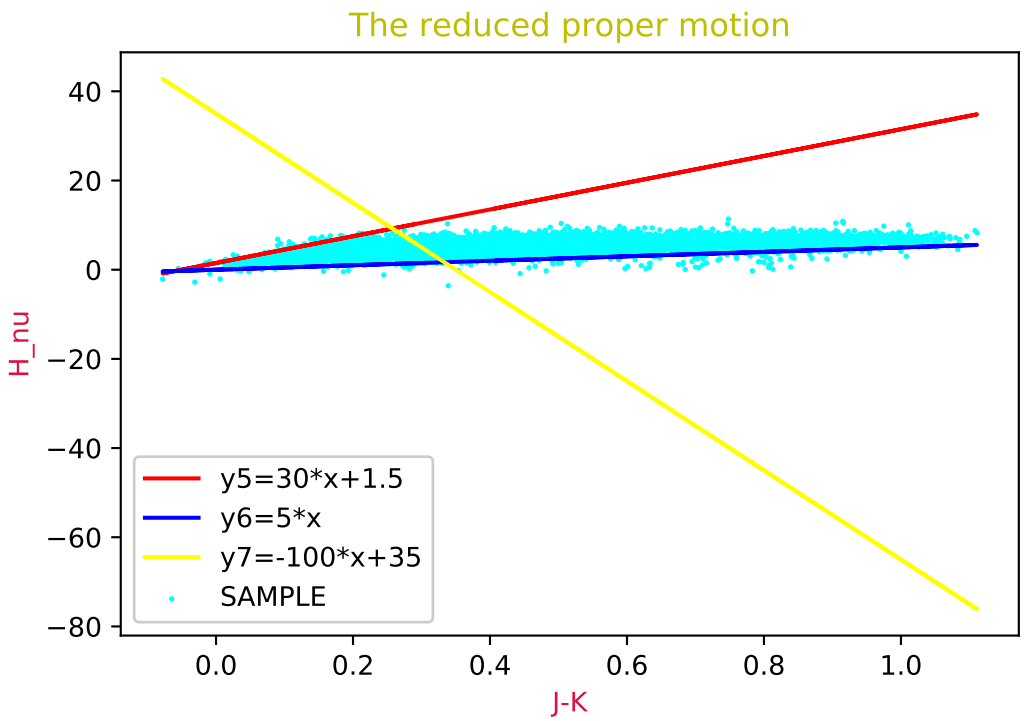

*figure*4.
[]In this picture, we further cut the sample.

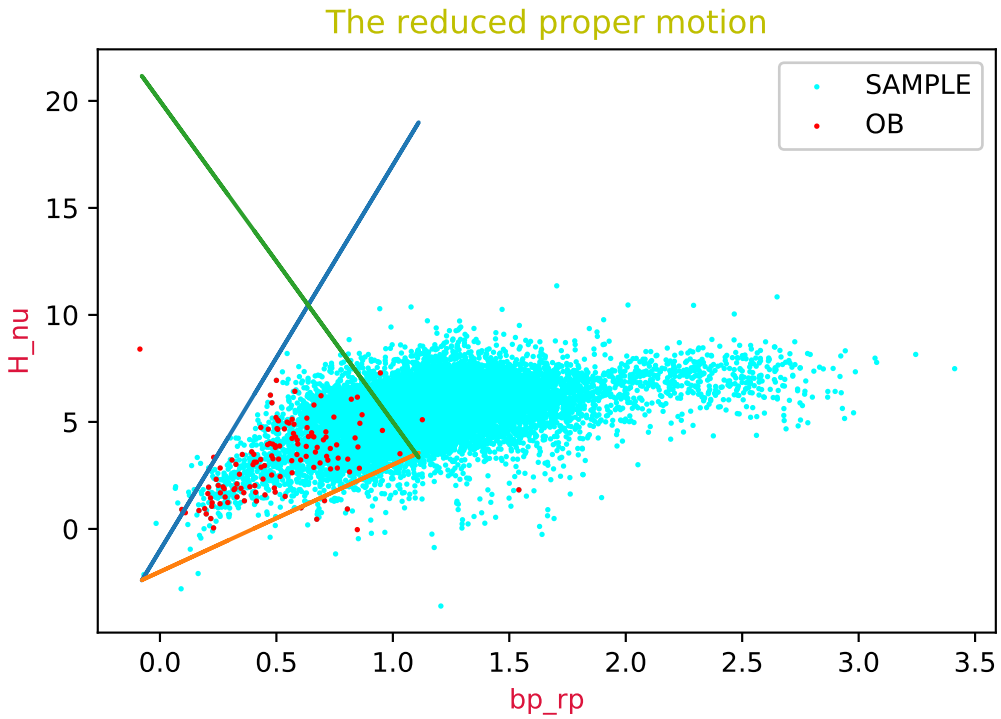

*figure*5.
[]In this picture, we further cut the sample.

4. CONCLUSION

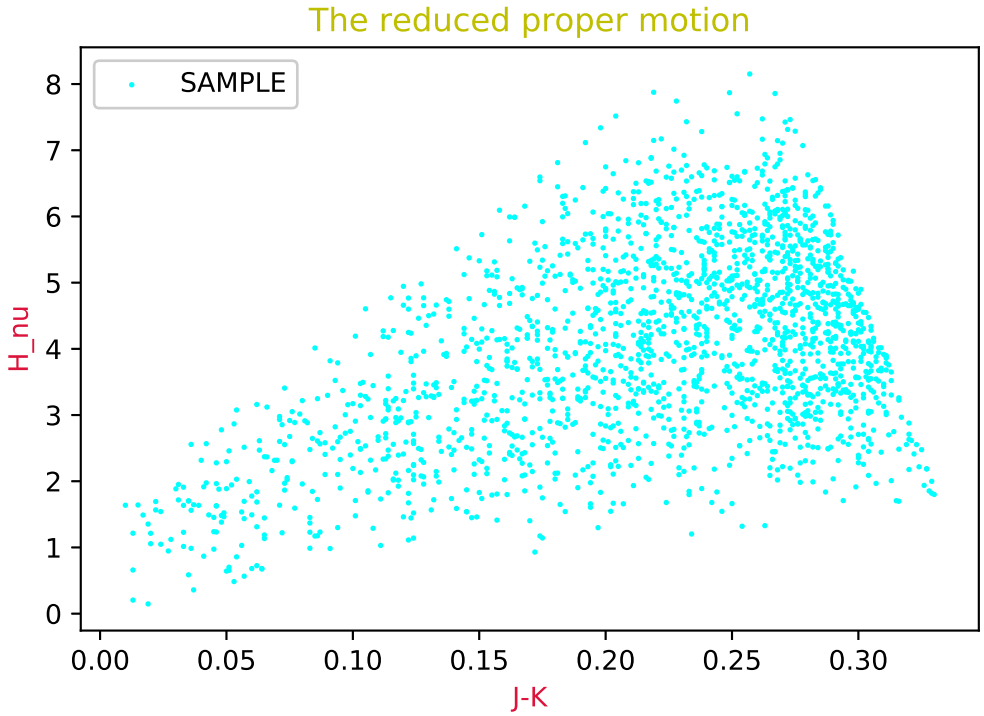

*figure*5.
[]This is a cut-out sample of 1998 stars.

5. PROSPECT

So far, we have cut 1998 stars from the sample, but they are not all OB stars. We will continue to screen OB stars from them by other means, and finally reach a high purity OB catalogue.