

Using Machine-Learning to obtain Be star candidates

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Abstract / Classical B-type emission line (Be) stars are non-supergiant stars whose spectra exhibit or have exhibited emission in the $H\alpha$ line. This emission is interpreted as arising from an optically-thin gaseous circumstellar disk. One technique commonly used to identify classical Be star candidates is the use of photometric 2-colour diagrams (2-CDs) that utilize a narrow-band filter centered on the $H\alpha$ line and an associated filter that samples the nearby continuum region. However, it is necessary to consider that these 2-CDs can identify other astrophysical sources that emit at $H\alpha$ besides classical Be stars, such as supergiants, luminous blue variables, Wolf-Rayet stars, B[e] stars, etc.

To disentangle OB-type stars in four groups: emission line stars, sub- and over-luminous stars, and normal stars, we use supervised machine learning algorithms. This algorithm learning was trained using VPHAS data in the filters $u, g, r, H\alpha$, and i . The classification algorithm is then applied to a new sample of dataset in order to separate new OB candidates in the different classes mentioned above.

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