CODE FOR CALCULATING THE MASS OF A STAR ONTO THE HR DIAGRAM

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ABSTRACT. Employing the statistical analysis of Muzyliev (1978, Nauch. Inform. Astronom. Council USSR Acad. Sci. 41, 94) we have made a code for obtaining the mass of a star, if the two evolutionary tracks along which it lies are known. The code has been adapted to use it with evolutionary tracks (either with mass loss or without it). We likewise treat the ambiguous position of some stars (normally masive ones) onto the CM diagram (where the star could be describing one of the "loops" predicted by the theory).

The code may be divided into four stages:

I. FILE APERTURE: It opens the files destinated to storage the output values of the interpolated masses for all the points of the HR diagram enclosed by the tracks (taken by intervals of 0.001 on both axis). We call APERTURE to the subroutine that uses direct access files of 250 lines of 2000 bytes each (500 values), which result to have a total size of half a megabyte per file. We have done that with the aim of trying to accelerate the data search process, whereas the size was thought to easily handle it.

II. DATA READING: Each of the tracks is represented by a matrix of three columns (Log(L/Lo), Log(Teff) and Mass) and as many rows as points are to describe the tracks. Therefore, the input file is composed by so many matrixes as tracks are employed.

III. BOXES AND MASS CALCULATION FOR ALL THE ENCLOSED POINTS: The path trought the boxes (a region defined by two consecutive points along a track and the corresponding ones on the next track) in the diagram, in our case, is done following the evolutionary direction of the tracks and going from those corresponding to the less massive stars to the more massive ones. The subroutine CALL inscribe each box within a rectangle. Then using the Muzyliev method (subroutine MASS) we compute the mass values of each point within the box.

IV. CLOSE OF FILES