

WPI21120

LOW MASS STARS MODELS

TASKS

- Keeping updated the physical description of low-mass models
- Study the effect of rotation and correlated mixing in the results obtained with codes that do not include them yet (in coll. with WPI21200)
- Testing the theoretical evolutionary framework on empirical data, such as stellar clusters and eclipsing binaries.
- Comparing models computed by different groups participating in the project.

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OUTPUT

- Package of grids of updated 1-D models for MS and Sub-giants
- Masses from 0.7 to the corresponding to F5 in MS
- Large range of chemical compositions
- Evolutionary tracks (*which quantities?*) and structure files in format for oscillation computations
- Documentation user guide with a detailed description of grids content and physics assumed in the models

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INPUT

- Existing grids of models **(? in general grids of tracks, no models)**
- Relevant data concerning physics inputs: EoS, radiative (and conductive) opacities, nuclear reaction rates, boundary conditions from the atmosphere models (WPI22000)... **(discussed yesterday, we should agree on the minimum requirements for first grid)**
- **Evolutionary code and numerical tools for extracting the structural and evolutionary properties of the various stellar models**

- From the initial definition of range and steps in the parameters of the grid ($M, Z, Y, a_{conv}, a_{ov}, \dots$ age) \Rightarrow one taking into account recent studies or fittings (ex. HH)
- How to use the letter of intent: several groups propose to compute I-D grids with different evol. codes?
- We cannot redo the work done in ESTA: the different groups should do themselves the check

CODE REQUIREMENTS

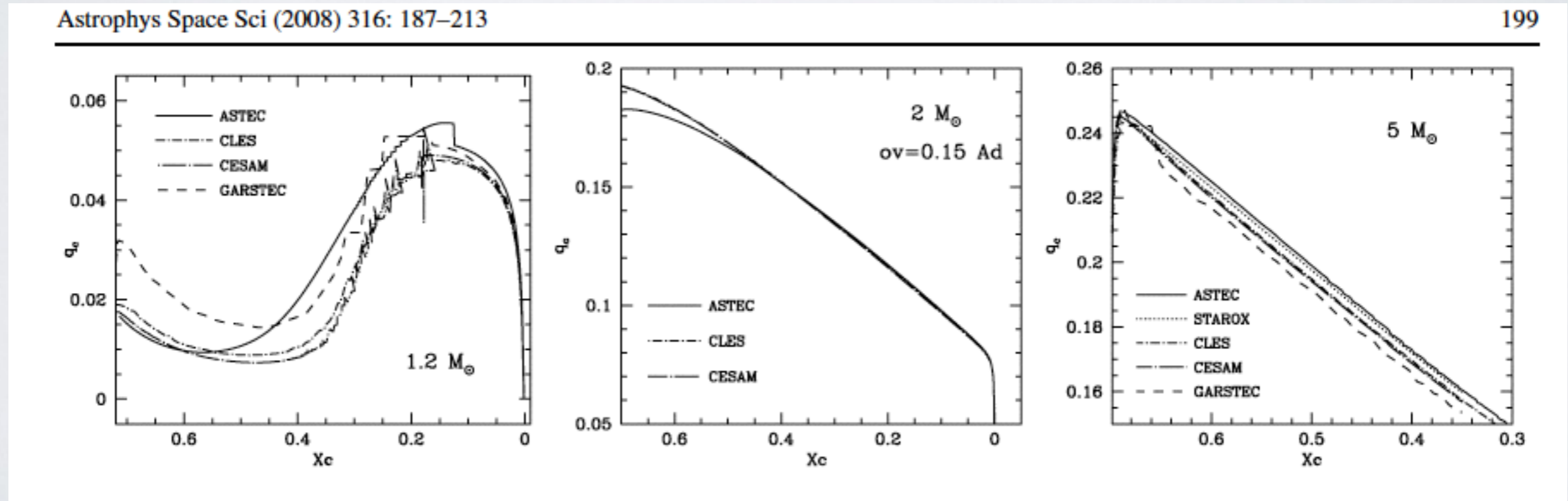
- If different mass domains will be computed with different codes => models in the transition region have to agree as much as possible
- Stability of the code in all the grid domain
- No restriction of applicability for grid range
- The code must be modifiable
- It can be used by other people (free and easy)
- The input physics will be selected by the WP before the computation of the grid
- Computations have to begin in the PMS
- The output will be complete hydrostatic model in a standard format

To spare time: use the experience from ESTA experiment

The results obtained from different codes are generally in good agreement
(provided they adopt the same physics inputs)

BUT

significant differences may appear in the location of C/R boundaries



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Quantify the effect on planet host parameter extraction

Non only for C/R but for each ingredient different from the
standard physics input

- To Update the Roadmap
- Time-table, for us, but we need inputs from other WPS
- Computing resources and manpower