PARSEC V2.0: Stellar tracks and isochrones of low and intermediate mass stars with rotation

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Aim

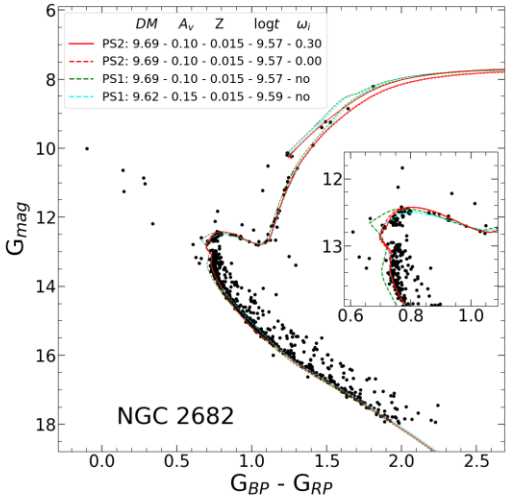
- Present a new collection of rotating-tracks and isochrones, computed with PARSEC V2.0 with solar chemical mixtures

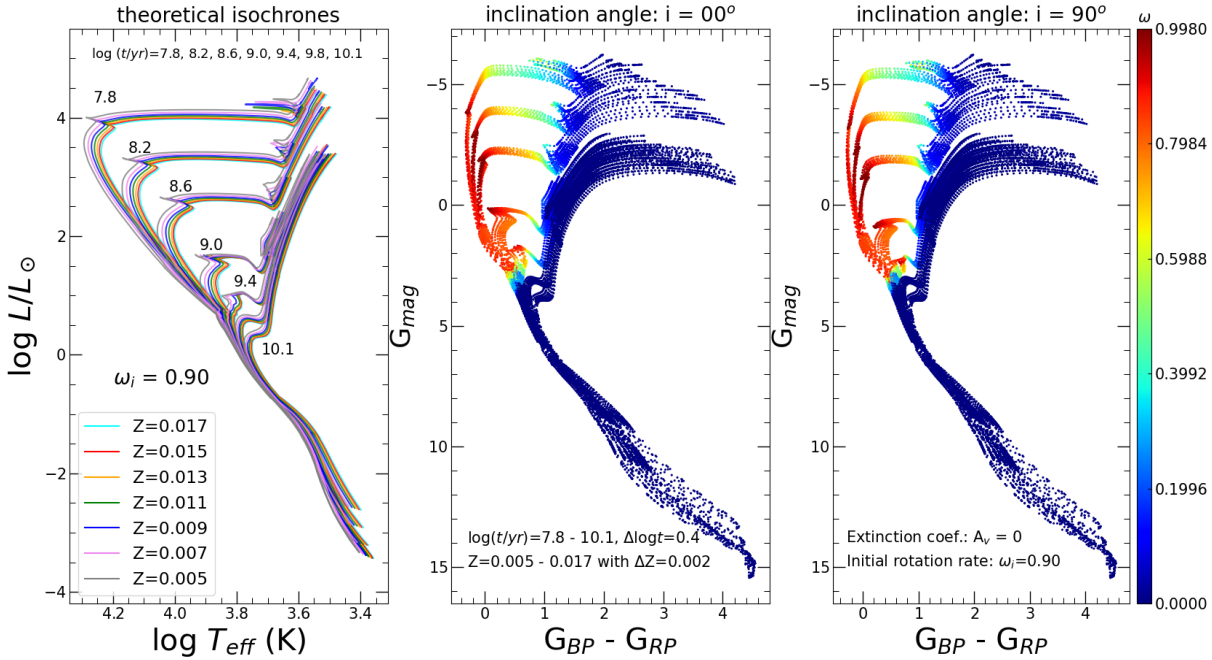
Method

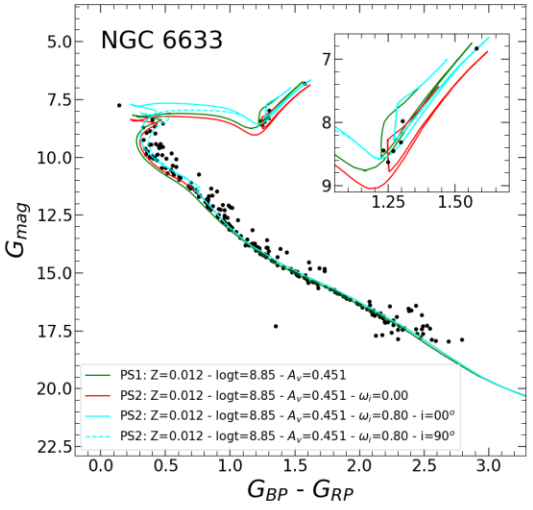
- Includes the new calibration of overshooting λ_{ov} = 0.0 - 0.4, Λ_e = 0.5 - 0.7 H_p
- Includes the improvements of nuclear network and the treatment of chemical mixing scheme
- Includes mass loss during the evolution phases

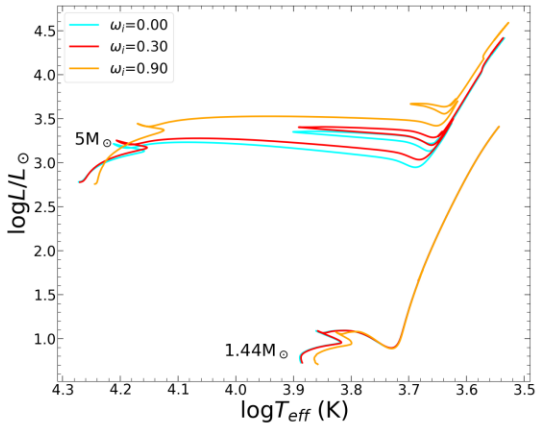
Set up

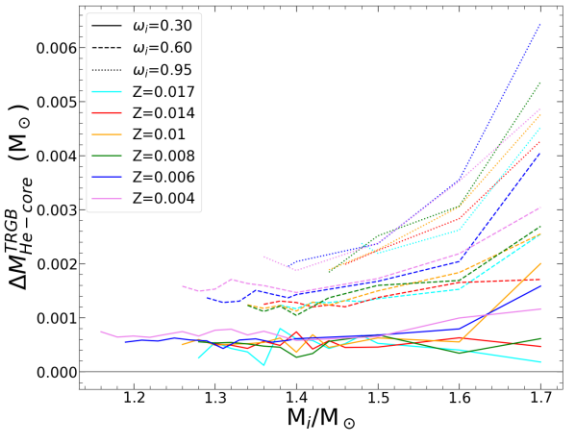
- Z-range: 0.004 - 0.017
- Mass range: 0.09 - 14 $M_\odot$
- Initial rotation rate: 0.00, 0.30, 0.60, 0.80, 0.90, 0.95, 0.99

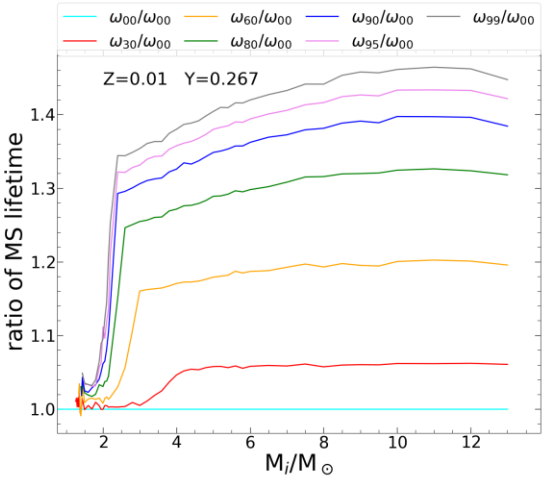


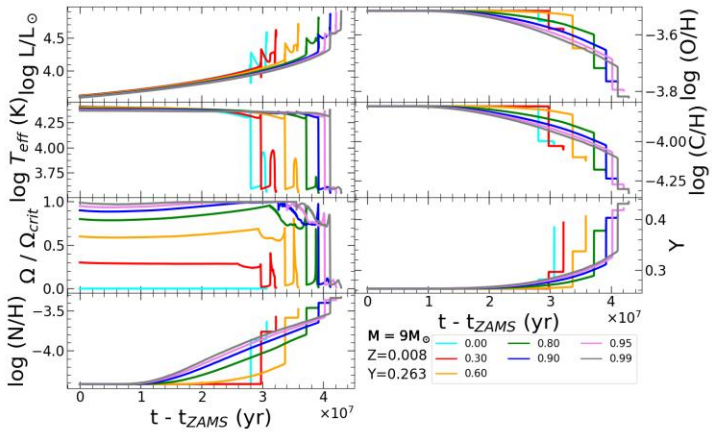


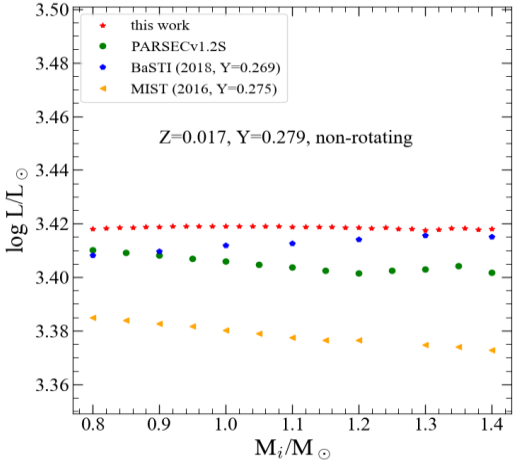












Concluding remarks

- We checked the effects of rotation on the evolutionary HRD
- On the surface abundances: the faster the star rotates on the MS, the more N and He appear at the surface, and the more C and O are depleted
- Stable slope in luminosity at the RGB's tip in low-mass star area
- Rotation enhances a modest amount of He-core mass at the TRGB phase
- The faster the stars rotate, the longer they stay in MS phase

Future prospects

- Extend the calculation to lower metallicities domain with suitable chemical mixtures
- Explaining the mass and position of the binary WOCS 11028 in M67 by varying the initial He-content