# Characteristics of convection and overshooting in RGB and AGB stars

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Based on the turbulent convection model (TCM) of Li & Yang (2007), we have studied the characteristics of turbulent convection in the envelopes of 2 and 5M stars at the RGB and AGB phases. The TCM has been applied successfully in the whole convective envelopes including the convective unstable zone and the overshooting regions. We find that the convective motions become stronger and stronger when the stellar models are located upper and upper along the Hayashi line. In the convective unstable zone, we find that the turbulent correlations are proportional to functions of a common factor $(\nabla-\nabla_{ad})\bar{T}$, which explains similar distributions of those correlations. For the TCM we find that if the obtained stellar structure of temperature is close to that of the MLT, the convective motion will be at a much larger velocity and thus more violent. However, if the turbulent velocity is adjusted to close to that of the MLT, the superadiabatic convection zone is much more extended inward and a lower effective temperature of the stellar model will be obtained. For the overshooting distance we find that the e-folding lengths of the turbulent kinetic energy k in both the top and bottom overshooting regions decrease as the stellar model is located up along the Hayashi line, but both the extents of the decrease are not obvious. And the overshooting distances of the turbulent correlation $\bar{u_{r}^{'}T^{'}}$ are almost the same for the different stellar models with a same set of TCM's parameters. ...

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