AGB evolution with overshoot: hot bottom burning vs. dredge-up

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In recent stellar evolution calculations (Herwig et al. 1997) we have considered diffusive overshoot for all convective boundaries which leads to a considerable change in the models. This method provides for AGB stars a sufficient amount of dredge up to form low-mass carbon stars as required from observations. Additionally it leads to the formation of ^{13}C as neutron source to drive the s-process in these stars.

However the consequences for massive AGB stars, which suffer from hot bottom burning, remains to be investigated in detail. Hot bottom burning, i.e. the penetration of the convective envelope into the hydrogen burning shell, provides lithium-rich AGB stars and may prevent the carbon star stage for almost the whole AGB lifetime by turning ^{12}C into ^{13}C and ^{14}N.

We continue to extend our computations to hot bottom burning models including a coupled treatment of nucleosynthesis and mixing. Due to overshoot the models show very efficient dredge up. The consequence of the simultaneous treatment of mixing and burning is investigated and the competition between hot bottom burning and dredge up with respect to the chemical evolution is studied.