

The impact of reduced mass loss rates on the evolution of massive stars

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Mass loss is a very important aspect of the life of massive stars. After briefly reviewing its importance, we discuss the impact of the recently proposed downward revision of mass loss rates due to clumping (difficulty to form Wolf-Rayet stars and production of critically rotating stars). Although a small reduction might be allowed, large reduction factors around ten are disfavoured.

We then discuss the possibility of significant mass loss at very low metallicity due to stars reaching break-up velocities and especially due to the metal enrichment of the surface of the star via rotational and convective mixing. This significant mass loss may help the first very massive stars avoid the fate of pair-creation supernova, the chemical signature of which is not observed in extremely metal poor stars. The chemical composition of the very low metallicity winds is very similar to that of the most metal poor star known to date, HE1327-2326 and offer an interesting explanation for the origin of the metals in this star. We also discuss the importance of mass loss in the context of long and soft gamma-ray bursts and pair-creation supernovae. Finally, we would like to stress that mass loss in cooler parts of the HR-diagram (luminous blue variable and yellow and red supergiant stages) are much more uncertain than in the hot part. More work needs to be done in these areas to better constrain the evolution of the most massive stars.

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