

Some exercises to practise (c8601-06)

If not stated differently, references are to the text „Základy fyziky hvězdných atmosfér” (version 19. května 2024) stored in the IS. HM refers to the book Theory of Stellar Atmospheres (Hubeny and Mihalas, 2014). M78 refers to the book Stellar Atmospheres (Mihalas, 1978). LC refers to the book Introduction to Stellar Winds (Lamers and Cassinelli, 1999).

1. Consider the equation of motion for the dust-driven wind in the form (gas pressure gradient has been neglected)

$$v_g \frac{dv_g}{dr} = \frac{GM_*}{r^2} (\Gamma_d - 1) \quad (21.13)$$

Integrate this equation to obtain the wind velocity law

$$v_g(r) = v_\infty \left(1 - \frac{r_c}{r}\right)^{\frac{1}{2}} \quad (21.15)$$

and write an expression for the terminal wind velocity v_∞ .

(section 21; LC section 7.7.1)