time-scales $10^4$ to $10^6$ years, during the red supergiant evolutionary phase. The appearance of turbulent elements with characteristic sizes a few percent of the stellar radius and r.m.s. velocities one third the escape speed of the star is required for efficient breaking of stellar rotation. This model predicts the formation of a cool silicate disc or torus around the star because of the preferred expulsion of material near equatorial regions of red supergiants.

04.12.05 Outer Atmospheres of Cool Stars: The Sharp Division into Solar-Type and Alpha Orionis-Type Stars. LINSKY, J.L. and HAISCH, B.M. JILA, Univ. of Colo. and NASA - IUE short wavelength (175-2000 Å) spectra of late-type stars clearly indicate two separate and distinct groups of stars. The solar-type group shows spectral lines formed at temperatures of $5 \times 10^3$ - $2 \times 10^5$ K, indicative of solar-like chromospheres, transition regions, and by implication unseen coronae at hotter temperatures. Examples of solar-type stars observed are F2-K4 dwarfs and subgiants G and early K giants, including θ Dra (G2 II), υ Vel (G5 III), α Aur (G5 III+), λ And (G8 III-IV), and β Cet (K1 III). The α Orionis-type group shows lines formed at temperatures no hotter than 10,000-20,000 K, indicative of chromospheres and envelopes only. This group consists of K giants and G-M supergiants, including ε Gem (G8 Ib), α Uma (K0 II-III), α Boo (K2 III), α Ser (K2 III), ε Sco (K2 III-IV), and α Ori (K2 lab). We interpret this sharp change in character of the outer atmospheres of stars on either side of the sharp dividing line between the two groups as due to the rapid onset of large stellar winds, an hypothesis recently proposed on theoretical grounds by Muller and Stencel, and the thermal instability resulting from the temperature dependence of the radiative loss rate. This work is supported by NASA under grants NAS5-23274 and NGL-06-003-057 to the University of Colorado.

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06.12.05 HeI 10830 Å Observations of Late Type Stars. G. O'BRIEN, and D. LAMBERT, Univ. of Texas at Austin - Observations of the He I 10830 Å line have been obtained for about thirty late type giants and supergiants using the Reticon array detector on the 2.7m telescope at McDonald Observatory. The helium line has been observed in emission in α Her, γ Dra, γ Aqu, α Boo, and ε Peg and shows strong absorption in α Uma, ε Gem, β Cet, β Dra, and α Aur. The emission from α Her is surprising because the star is surrounded by an extensive circumstellar gas and dust shell. The He I emission from α Boo is variable: the F Cyn profile observed in March and May 1978 changed into an absorption line in August, and early October it had disappeared completely. Two weeks later it re-appeared in emission. The time scale of these variations is too rapid to be explained by rotation alone but may be the result of a large supergranule element, of the type proposed by Schwarzschild, rising to the surface near the limb of the star and ejecting matter into the chromosphere.

07.12.05 Radiatively-Driven Stellar Winds. I. The Domain of Mass Loss in the H-R Diagram. ABOTT, D.C., UV-Madison. - The outermost layer of an initially static atmosphere is dynamically unstable with respect to radiation pressure in an early-type star whose luminosity exceeds a minimum value, $L_\odot$. This paper reports theoretical calculations which map $L_\odot$ as a function of effective temperature in the H-R diagram. The computations