# UV diagnostic of porosity-free mass-loss estimates in B stars

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We seek to establish evidence in UV P Cygni line profiles that the signs of wind clumping and porosity vary with velocity. We aim to demonstrate empirically that while at most wind velocities optically thick clumps cover only a fraction of the stellar surface, close to the terminal velocity where narrow absorption components (NACs) appear in UV lines the covering factor is approximately unity. SEI line-synthesis models are used to determine the radial optical depths of blue and red components of the SiIV 1400 resonance line doublet in a sample of 12 B0 to B4 supergiants. We focus on stars with well developed NACs and relatively low terminal velocity so that the SiIV doublet components can be treated as radiatively decoupled and formed independently. For all 12 stars the mean optical depth ratio of the blue to red components is closer to ~ 2 (i.e. the ratio of oscillator strengths) in the NACs than at intermediate and lower velocities. The product of mass-loss rate and Si^3+ ion fraction calculated from the NAC optical depths is a factor of ~ 2 to 9 higher compared to mass-loss values sampled at ~ 0.4 to 0.6 of the terminal velocity. Since the wind effectively becomes `smooth' at the high NAC velocities and the column density is uniformly distributed over the stellar disk, the optical depths of the NACs are not seriously affected by porosity and this feature thus provides the most reliable measurement of mass-loss rate in the UV lines. Applications of this result to the weak-wind problem of late O-dwarf stars and the ``PV mass loss discordance'' in early O supergiants are discussed.

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