
The Flux Ratio of the Resonance Doublet in Symbiotic Stars and Planetary Nebulae

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We investigate the effect of dust and collisional de-excitation on the emergent flux ratios of the resonance doublets in symbiotic stars and planetary nebulae. It is argued that the collisional de-excitation is important only in high density media with $n_e \geq 10^{10} \text{ cm}^{-3}$, which appears to be met in symbiotic stars exhibiting C III 1909 lines. With dust optical depth $\tau_d \sim 0.1$, the flux ratio approaches 1, which is referred to the optically thick limit. The IUE data archive has been searched for investigation of the flux ratios, from which we found a number of anomalous cases showing weaker short wavelength components. We discuss the importance of this process as an astrophysical diagnostic for various emission nebulae and also consider the similar processes for other resonance doublets including C IV, Mg II and N V.