

[ST14] Collisional De-excitation Effect on Resonance Doublet Flux Ratios  
in Symbiotic Stars

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Resonance doublets including O VI 1032, 1038, N V 1238, 1243, and C IV 1548, 1550 are important coolants for emission nebulae surrounding hot white dwarf in symbiotic stars. Arising from S<sub>1/2</sub>-P<sub>1/2</sub>, P<sub>3/2</sub> transitions, resonance doublets are expected to be generated with the fixed ratio of 2:1, which is inconsistent with observed data for many symbiotic stars from IUE and FUSE data. Instead, they are known to exhibit various flux ratios between 1:1 and 2:1. Using a Monte Carlo technique, we investigate the collisional de-excitation effect on the resonance line fluxes in order to quantify the photon destruction rate in resonantly scattering media, which eventually lead to various line ratios for resonance doublets. We find that various line ratios are obtained in media with the line center optical depth exceeding  $10^4$  and collisional de-excitation rate of  $10^{-4}$ .