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Far-UV radiation from hot subdwarf stars in early-type galaxies

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Far-ultraviolet (FUV) excess is crucial to our understanding of early-type galaxies and it is widely believed that the FUV radiation originates mainly from hot subwarf stars. Hot subdwarf stars may form from binary interactions or from single star evolution. In the binary channel, a star near the tip of the first giant branch (FGB) may get its envelope removed by its companion via stable Roche lobe overflow or common envelope ejection, and then evolves to a hot subdwarf star (Han *et al.* 2002, 2003, 2007). Such a process does not depend much on metallicity. In the single star channel, a low mass star may lose its envelope at the tip of FGB to become a hot subdwarf if the star is metal rich (over solar) and its envelope binding energy becomes positive (Han *et al.* 1994). We conclude from the combination of the two channels that

- FUV excess is universal (i.e. from dwarf to giant ellipticals),
- the FUV excess does NOT depend on metallicity or redshift if the metallicity is less than solar and DOES depend on metallicity or redshift if the metallicity is over solar.

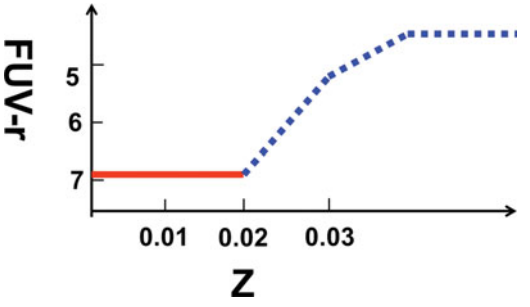

Figure 1. A schematic view of the FUV excess - metallicity relation as predicted by our theory. Binary channel dominates FUV for low metallicity (solid line) while single star channel dominates for high metallicity (dotted line)

References

Han, Z., Podsiadlowski, Ph., & Eggleton, P. P. 1994, *MNRAS*, 270, 121
Han, Z., Podsiadlowski, Ph., Maxted, P. F. L., Marsh, T. R., & Ivanova, N. 2002, *MNRAS*, 336, 449
Han, Z., Podsiadlowski, Ph., Maxted, P. F. L., & Marsh, T. R., 2003, *MNRAS*, 341, 669
Han, Z., Podsiadlowski, Ph., & Lynas-Gray, A. E. 2007, *MNRAS*, 380, 1098

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