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Star Forming Galaxies and AGN Hosts: The Seagull Wings

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Abstract. Using photoionization models applied to the data from the Sloan Digital Sky Survey (SDSS) we propose a physically motivated dividing line in the [OIII]/Hβ vs [NII]/Hα (BPT) diagram between normal star forming (NSF) galaxies and AGN hosts. We also propose a new diagnostic diagram which can be used for optical spectra of galaxies with redshifts up to z = 1.3.

Keywords. galaxies: active — galaxies: starburst — emission lines: surveys

1. Introduction

In the BPT diagram, NSF galaxies and AGN hosts from the SDSS form two sequences, which look like the wings of a seagull. The Kewley *et al.* (2001) and Kauffman *et al.* (2003) lines to distinguish both classes are too "generous"for NSF galaxies. We propose a better dividing line, given by: $y = (-30.787 + 1.1358x + 0.27297x^2)\tanh(5.7409x) - 31.093$, where $y = \log$ [OIII]/Hβ, and $x = \log$ [NII]/Hα.

We then propose a new diagnostic diagram, where NSF galaxies and AGN hosts are divided by the line: $D_n(4000) = -0.15(\log x + 1) + 1.7$, where $x = \max$(EW[OII], EW[NeIII]).

See Stasińska *et al.* (2006) for more details.

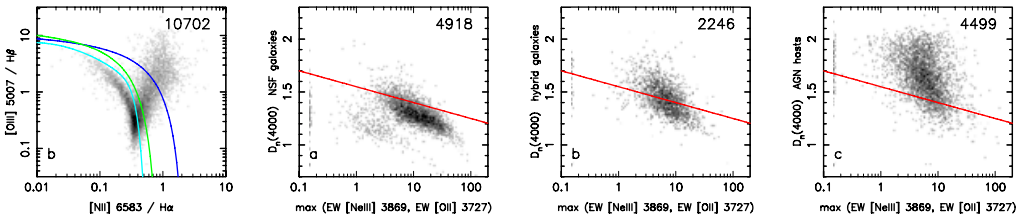

Figure 1. a: The BPT diagram for 10702 galaxies from the SDSS DR2 (Abazadjian *et al.* 2002). The Kewley line, the Kauffmann line and our line are shown from top to bottom. b, c, d: $D_n(4000)$ versus max(EW[OII], EW[NeIII]) for NSF galaxies, hybrid galaxies and AGN galaxies respectively. The red line is the adopted boundary between NSF and AGN galaxies.

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References

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