

Supplemental Animated Figures for "Multidimensional Data Driven Classification of Active Galaxies"

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In the "Multidimensional Data Driven Classification of Active Galaxies", we propose a soft allocation data driven (SoDDA) method, which computes the posterior probability of each galaxy being a star forming galaxy (SFG), a Seyfert, a LINER, or a Composite using Equation 11 in the relevant text. This classification is based on the clustering of galactic nuclei emission-line ratios in the 4-dimensional space defined by the $[N_{II}]/H\alpha$, $[S_{II}]/H\alpha$, $[O_I]/H\alpha$ and $[O_{III}]/H\beta$ ratios. In the paper we show the BPT diagnostic diagrams for the SDSS DR8 dataset (we refer the reader to the original paper for a detailed description of the dataset), with each galaxy colour coded according to its most probable galaxy class (red for SFGs, yellow for Seyferts, blue for LINERs, and green for the Composites) under SoDDA. Here, we present 3-dimensional rotating projections. The 3-dimensional rotating projections allows us to observe the complex structure of the 4 galaxy activity classes which is expressed through our soft allocation scheme.

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Figure 1. A 3-dimensional projection of the SDSS DR8 sample on the ($[N_{II}]/H\alpha$, $[S_{II}]/H\alpha$, and $[O_{III}]/H\beta$) volume, in which each datapoint is plotted with different colour according to the allocation from SoDDA classification scheme (red for SFGs, yellow for Seyferts, blue for LINERs and green for the Composites).

Figure 2.

A 3-dimensional projection of the SDSS DR8 sample on the ($[\text{N}_{\text{II}}]/\text{H}\alpha$, $[\text{O}_{\text{I}}]/\text{H}\alpha$, and $[\text{O}_{\text{III}}]/\text{H}\beta$) volume, in which each datapoint is plotted with different colour according to the allocation from SoDDA classification scheme (red for SFGs, yellow for Seyferts, blue for LINERs and green for the Composites).

Figure 3.

A 3-dimensional projection of the SDSS DR8 sample on the ($[\mathrm{N}_{\mathrm{II}}]/\mathrm{H}\alpha$, $[\mathrm{S}_{\mathrm{II}}]/\mathrm{H}\alpha$ and $[\mathrm{O}_{\mathrm{I}}]/\mathrm{H}\alpha$) volume, in which each datapoint is plotted with different colour according to the allocation from SoDDA classification scheme (red for SFGs, yellow for Seyferts, blue for LINERs and green for the Composites).

Figure 4.

A 3-dimensional projection of the SDSS DR8 sample on the ($[S_{II}]/H\alpha$, $[O_I]/H\alpha$, and $[O_{III}]/H\beta$) volume, in which each datapoint is plotted with different colour according to the allocation from SoDDA classification scheme (red for SFGs, yellow for Seyferts, blue for LINERs and green for the Composites).