Two-Face(s): ionized and neutral galactic winds in the local Universe.

The physical mechanism(s) driving the "quenching" of the star formation activity in galaxies, remains one of the least understood puzzles in the galaxy formation theoretical framework. According to the most recent theoretical models, the energetic feedback from active galactic nuclei (AGN) is believed to provide an effective mechanism to eject the gas away from the galaxy by powerful winds in very massive galaxies. However, below halo masses of 10^12Mo the galactic winds driven by the energy and momentum imprinted by massive stars to the surrounding ISM, are believed to be sufficiently energetic to eject the gas away from the galaxy potential well and stop the star formation.
In order to unmasking the nature of these two quenching processes (AGN and SF), we analyzed a complete spectroscopic galaxy sample (~600 000 spectra) drawn from the SDSS to look for evidence of galactic winds in the local Universe.
We focused on the shape of the [OIII]λ5007 emission line and interstellar Na I λ5890, 5895 (Na D) resonant line profiles as tracers of ionizing and neutral gas outflows, respectively.
I will show how the average [OIII]λ5007 and NaD line profile changes as function of star formation rate (SFR), stellar mass, disk inclination and nature of the dominant ionizing source in different BPT classes.
We find that, statistically, only “Light Breeze" can be observed in the local Universe only in AGN dominated sources. For purely SF galaxies we do not observe ionized gas outflows regardless of the SFR level. Only at very high SFR we detect a blue-shifted NaD line profile, likely indicating bulk motion of neutral gas from the disk. The additional analysis of Manga IFU data for a galaxy subsample (~1000 galaxies) sheds light on the different nature of the [OIII]λ5007 and NaD line profile outflows.
Both the integrated and spatially resolved data show that the galactic winds in local Universe have “Two Faces” which are related to two different ejection mechanisms, namely the neutral outflowing gas phase connected to the star formation rate along the galaxy disk and, the ionized winds related to the AGN feedback.