European Astronomical Society Annual Meeting-2020

On-line, June 29- July 3rd

Организация виртуальной платформы:

- Оргвзнос 80 евро за целую неделю (50 евро за 1 день);→
- Доступ послушать-посмотреть любую сессию БЕЗ включенного микрофона и камеры;→
- Вопросы можно задавать только письменно, через председателя заседания.
- Зато доступ к записям – еще месяц.

Симпозиумы и специальные сессии по галактикам:

- S3: Linking gas and star formation through cosmic time
- S6: Stellar and gas kinematics across cosmic time, connecting obs and theory
- S10: Gaia: the (2) billionstar galaxy census: The promise of (E)DR3
- S11: The Local Group on context: Galaxies in the local volume as a testbed of cosmology
- S15: The circumgalactic medium
- SS17: Compact passive and massive galaxies across the Universe
- SS19: Crossing the characteristic mass scales in galaxy evolution

Из пленарных:

- Альвио Рензини – лекция имени Волтьера – про эволюцию углового момента галактик: в 20-50 раз за 8 млрд лет!
- Ссылки на симуляции: T. Buck+2020, Kretschmer+2020, DeFilippis+2020 (TNG)
- Ссылки на наблюдения: N.Bouche+, Zabl+2019.

Наблюдения: MUSE+UVES

- Fossati+: MUDF и MAGG – группы галактик на z~0.7 (0.5<z<1.5) пары квазар-галактика, LLS +Lalpha на z>3.
- Zabl, Bouche et al.: MEGAFLOW (MusE Gas FLOw and Wind) – то же самое, но для изолированных галактик на z~1.
- Комбинация MUSE+UVES дает: красное смещение линий газа (MgII-abs), изофотную форму галактики, поле скоростей газа в галактике ([OII]-emis).

Zabl+2019

In total, the 22 quasar sightlines contain 79 strong Mg II absorbers with $EW_0^{\lambda 2796} > 0.3$ with $0.51 < z < 1.45$.

The multi NB images are created by combining NB-imag multiple emission lines (each over the same velocity range). included [O II] and depending on the redshift H β and/or | λ5007. Each NB image is created with a width of[5] 400 km s^{-} comparison, a virial velocity of 400 km s^{-1} corresponds to a mass of $\sim 10^{13}$ M$_{\odot}$, which is the typical halo mass for a g with stellar mass, M_* of 10^{11} M$_{\odot}$.

4.2 Mg II host association

With its 60 arcsec wide FoV, MUSE covers at redshift $z = 1$ about 480 kpc, so ~240 kpc in each direction from the quasar. To put this into perspective, the virial radius of a $z = 1$ galaxy with $M*$ and its corresponding halo mass of $\log(M_h/M_{\odot}) \approx 12.4$ is ≈200 kpc. Consequently, the MUSE observations allow us to identify the galaxies associated with the absorption, even if the associated absorption would be all the way out at the virial radius. However, due to the anticorrelation between impact parameter and $EW_0^{\lambda 2796}$ (Lanzetta & Bowen 1990; Chen et al. 2010; Nielsen et al. 2013a), we expect most of the strong Mg II absorbers to originate from gas at impact parameters, b, smaller than the virial radius. This justifies to focus in the Mg II host association on galaxy–absorber pairs which have $b \lesssim 100$ kpc.

From our MEGAFLOW survey of 79 Mg II absorbers with $EW_0^{\lambda 2796} \gtrsim 0.3$, we detect one or more galaxies in 75 per cent (59/79) of the cases within 100 kpc. When there is at least one galaxy, we find that 41 (10) absorbers have one (two) galaxies within 100 kpc, respectively, accounting together for the majority (51/59) of the sample. We choose the absorbers with a maximum of two galaxies within 100 kpc, in order to study isolated galaxies, and avoid groups where a unique host association becomes not

Геометрические критерии подбора галактик, ответственных за MgII

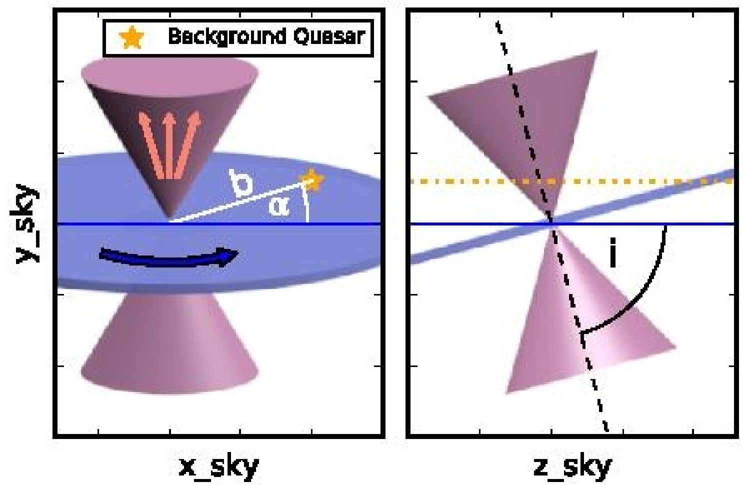


Figure 1. Assumed geometry of the cold CGM. *Left:* CGM geometry as observed on the sky-plane, where x_{sky} is without loss of generality aligned with the disc's p... the azimuthal angle α a... (orange) on the sky-pla... where z_{sky} is along the LOS. i is the inclination of the disc on the sky.

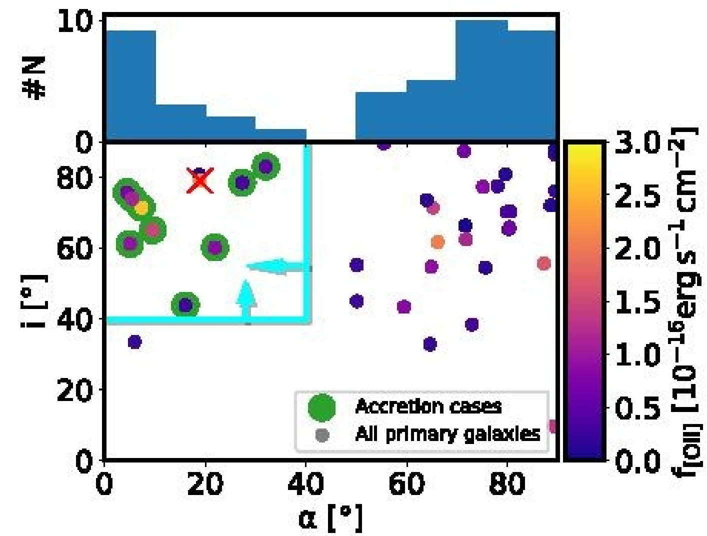


Figure 2. Distribution of the MEGAFLOW primary Mg II host galaxies (see Section 4.2). In the upper part the α histogram is shown for the points in the α–i plane below. The colour-scale indicates the [O II] flux of the galaxies. The nine points circled in green within the cyan boundaries are suitable (as in Section 4.3) candidates for this study. One galaxy in the selection region ... obtain robust inclinations.

Бимодальность по распределению угла отн. большой оси= inflow+outflow

Пример

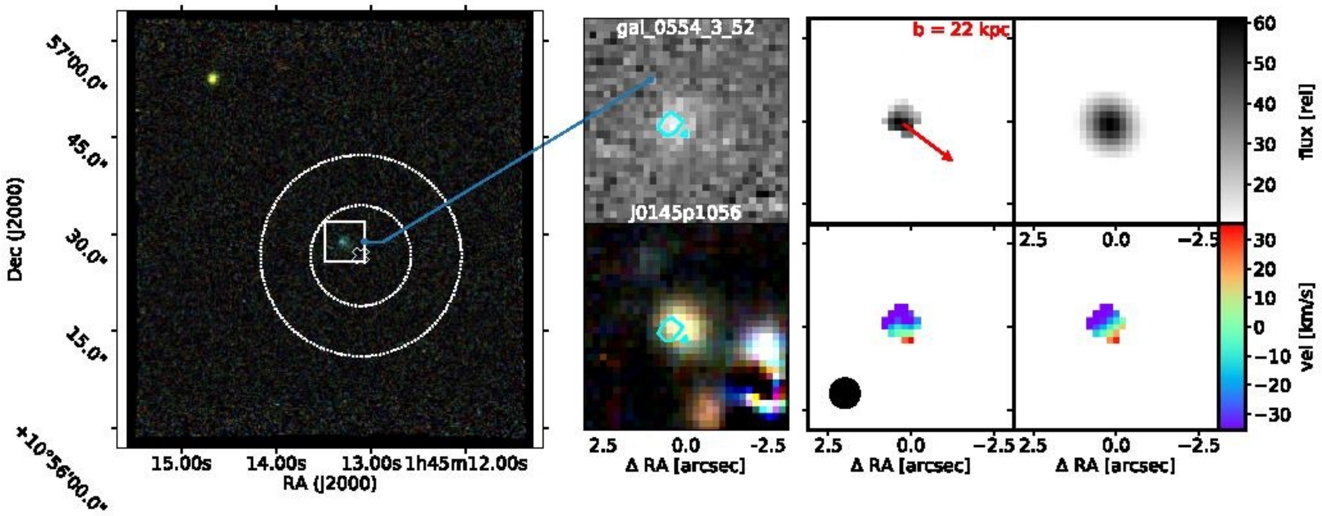
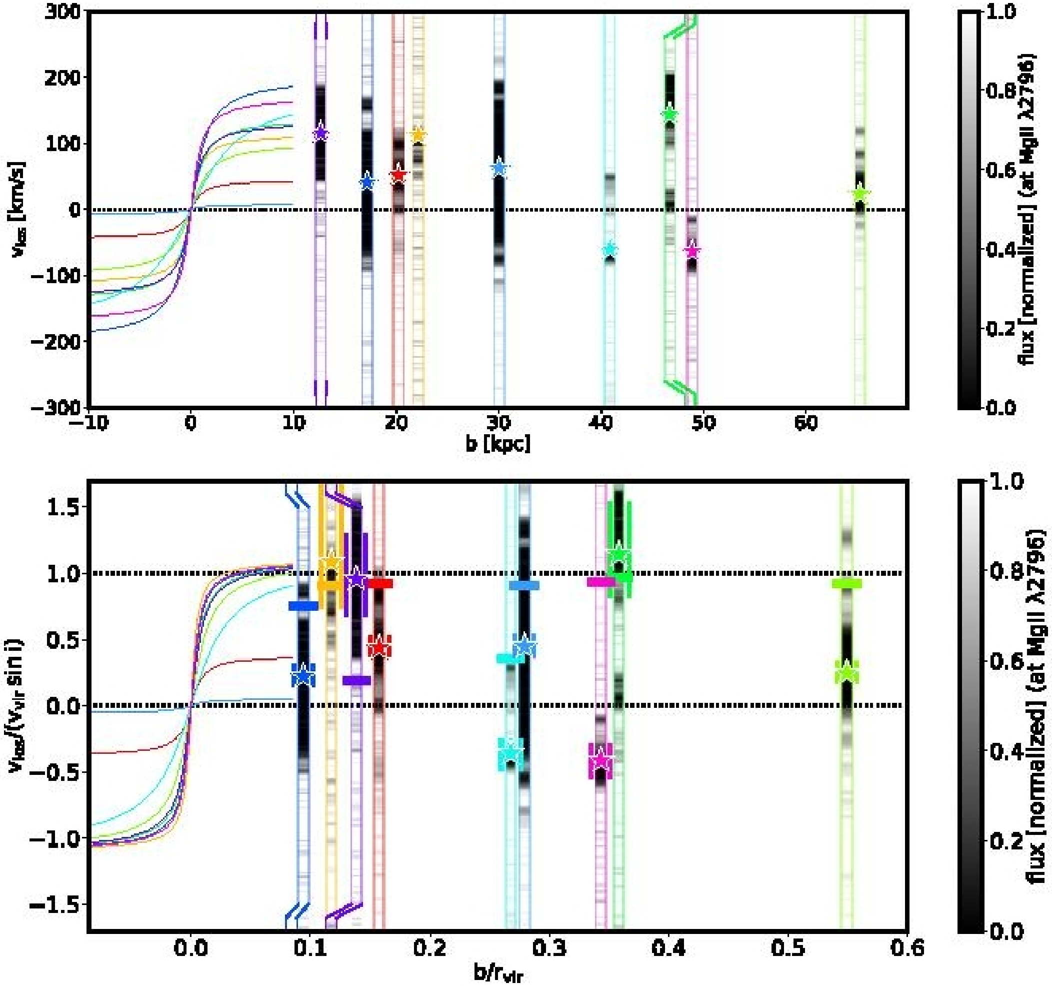


Figure 4. Column 1 (left): Shown is an [O II] NB image covering ±300 km s^{-1} around the redshift of the absorber *J0145p1056_0554*. More precisely, three slightly different [O II] NB images were used for each of the three channels of an RGB image. In such an image, emission lines blue-shifted with respect to the absorber redshift appear bluer, while those redshifted will appear redder. The position of the quasar is indicated as a white cross and circles indicate impact parameters corresponding to 50 and 100 kpc. A white box indicates an emission line galaxy associated with the absorber, meaning that the [O II] emission is in the filter. In the shown example there is only the primary galaxy. The remaining NB excess sources are either due to other emission lines than [O II] in the NB filter, which means that they are at other redshifts, or residuals from bright objects. Column 2: Top: Simple NB image of the primary galaxy optimized for redshift and width of the [O II] emission. Overlaid is a contour of this image. Below a colour image is displayed, where pseudo *V*, *R*, *I* broadband images constitute blue, green, and red channels, respectively. The same contour as in the NB image is overlaid. Column 3: Flux (top) and LOS velocity (bottom) maps obtained from direct fitting with *CAMEL* to the [O II] cube. More details are given in the text. The filled black circle in the lower left corner indicates the FWHM of the Moffat PSF at the observed wavelength of [O II]. Column 4: Similar as in column 3, but here the best-fitting model flux and velocity maps as obtained from fitting with GALPAK^{3D} are shown. The zero velocity in the velocity maps is taken from the GALPAK^{3D} redshift.

Как состыковать кривую вращения галактики и скорость MgII в спектре квазара



Если хотим плоские кривые вращения, то без радиальных потоков НЕ согласовать…

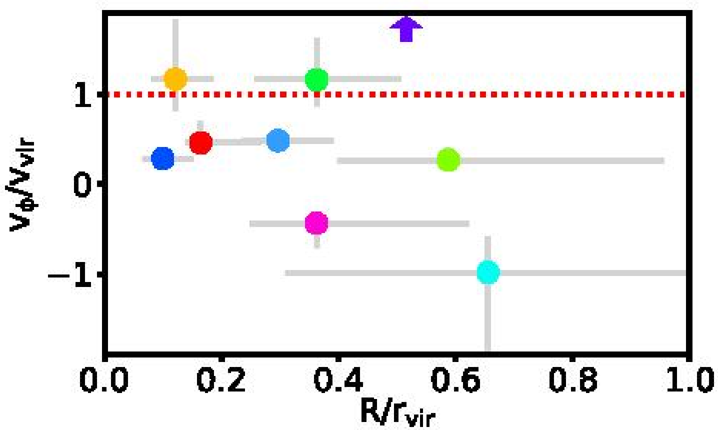


Figure 9. Tangential velocity v_ϕ inferred from $v_{\rm los}$ under the assumption that the gas is on pure circular orbits in the disc plane. For gas on stable circular orbits the expectation is that $v_\phi \approx v_{\rm vir}$. The two cases at the extreme ends of the $v_\phi/v_{\rm vir}$ distribution (*J1107* cyan; *J1509* purple, indicated by an arrow as outside of plot range) have both the highest α's and inclinations among our nine galaxy–absorber pairs. The values of the plotted points are listed in Table C4 of the Supplementary Appendix.

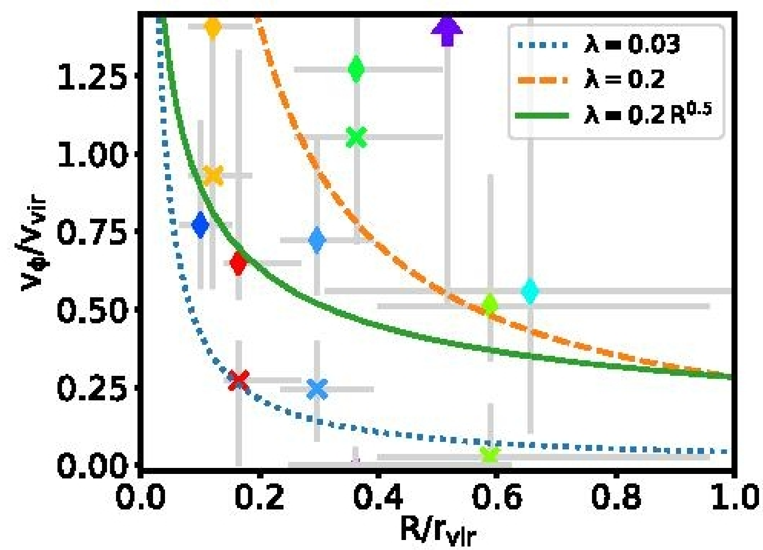


Figure 10. Rotation velocities, v_ϕ, inferred from measured $v_{\rm los}$ under the assumption of a radial velocity component with $v_r = -0.6 v_{\rm vir}$ and co-rotation with the galaxy for each of the nine absorbers. There can be up to two solutions per absorber. The projected LOS components of v_r and v_ϕ have the same sign for solutions indicated by crosses, while they have opposite signs for solutions indicated by diamonds. The lines indicate different spin parameters (λ, see equation 12), with their values indicated in the legend. The values of the plotted points are listed in Table C4 of the Supplementary Appendix.

Бюджет натекания газа – чуть меньше темпов звездообразования. Разумно.

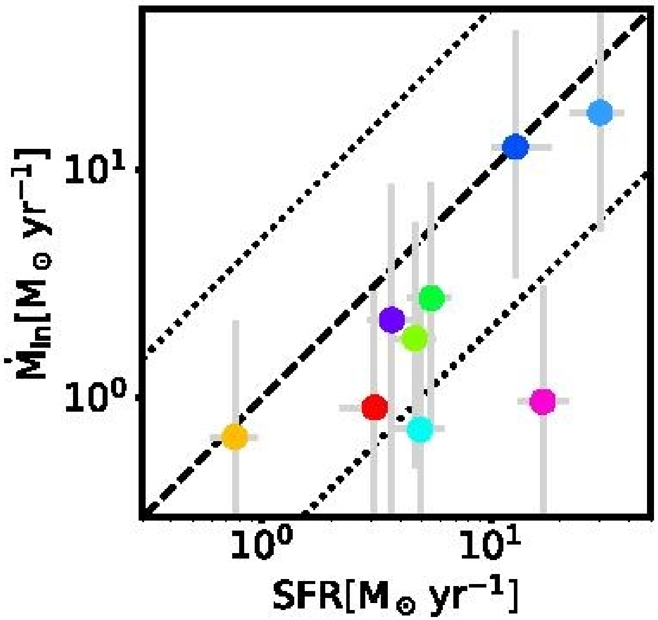


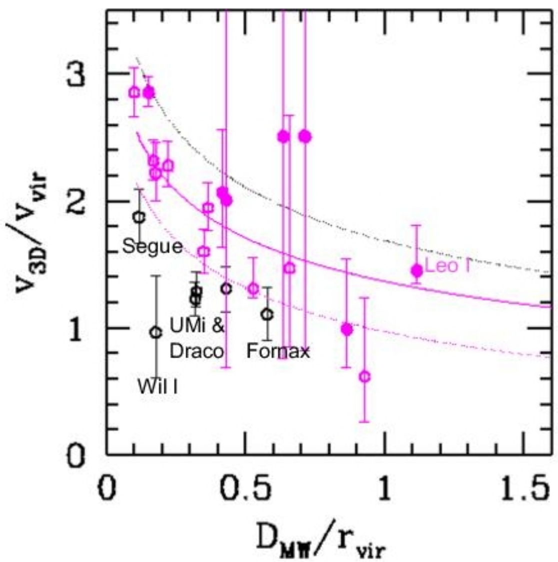
Figure 11. Mass inflow rate estimated from Mg II equivalent width plotted against SFR estimate obtained from [O II] flux corrected for reddening using the $E(B-V)$ estimate based on the Garn & Best (2010) M_*–extinction relation. The dashed line represents an 1:1 relation. The dotted lines represent deviations from the 1:1 correspondence by a factor five.

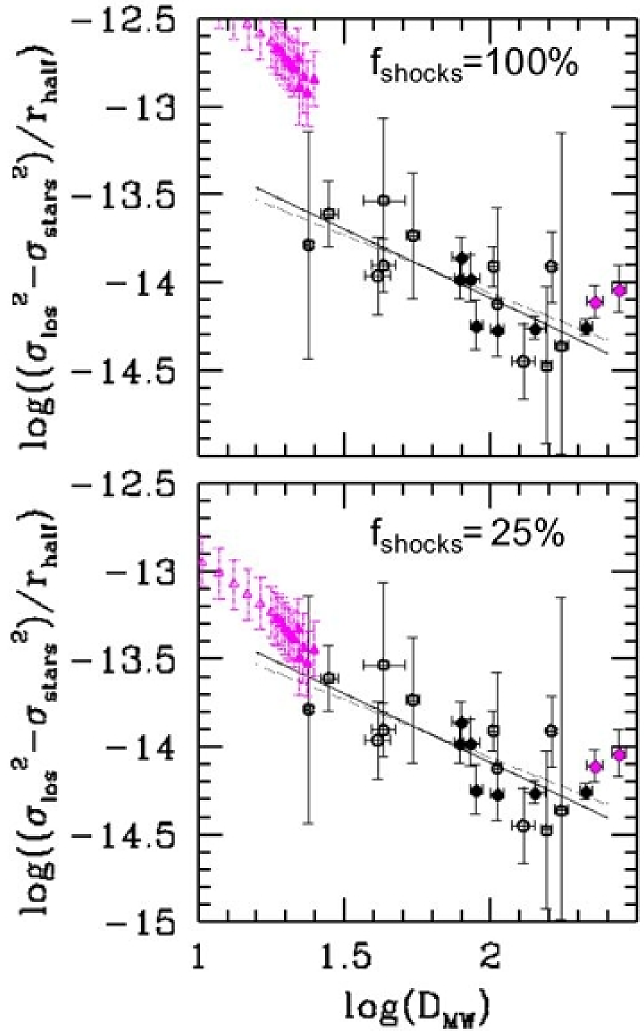
Из экзотики – Франсуа Аммер:

- У сфероидальных спутников нашей Галактики НЕТ темной материи!
- А дисперсии скоростей звезд такие большие, потому что их всех раздирает Млечный Путь.
- Потому что данные Gaia свидетельствуют, что ВСЕ спутники – в районе перицентра орбит.
- А значит они не могут быть долгоживущими…

3 статьи за 3 года, пара картинок

First passage:





Hammer+ ArXiv:2002.09493

Чем дальше от MW, тем меньше темной материи??