

Gas kinematics of void galaxies: Searching for evidences of gas accretion



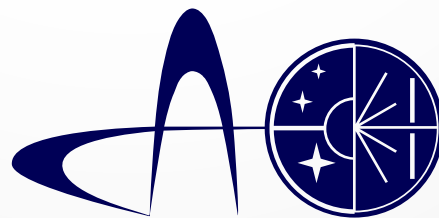
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³ *Instituto de Astrofísica de Canarias*



Our sample

Lynx-Cancer void

Pustilnik, Tepliakova (2011)

Pustilnik et al (2016)

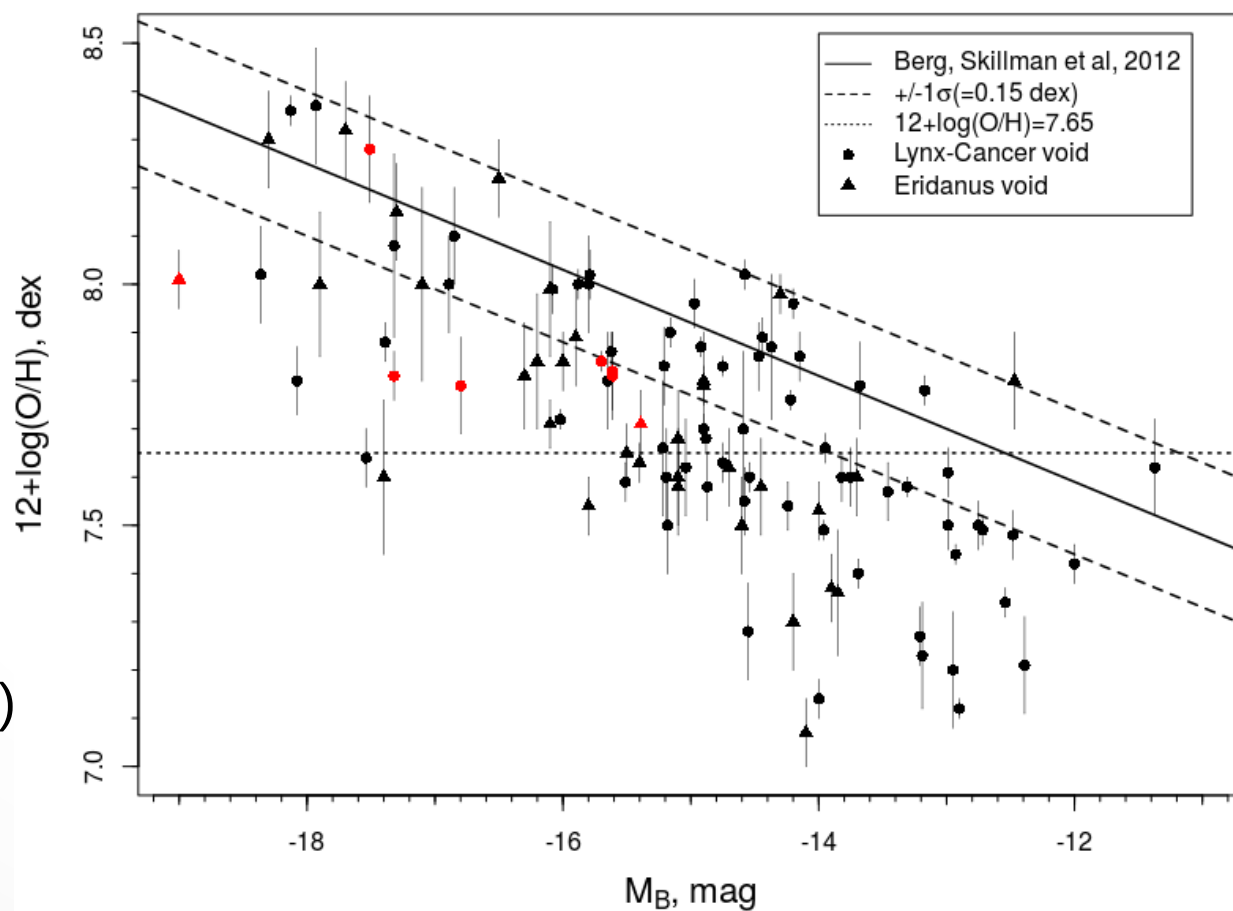
Eridanus void

Kniazev et al, in prep

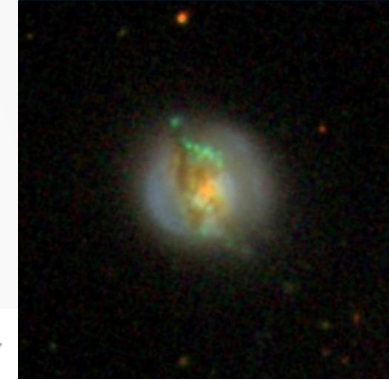
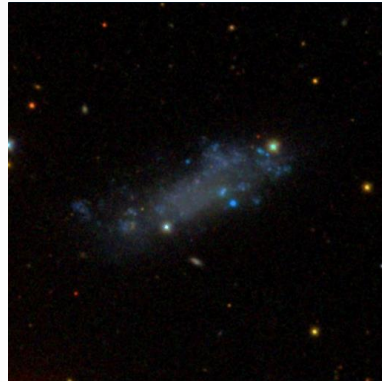
Observations:

Fabry-Perot interferometer at
SAO RAS 6m telescope (Russia)

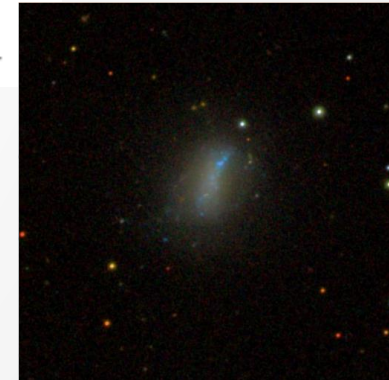
GhaFaS at WHT



Our sample

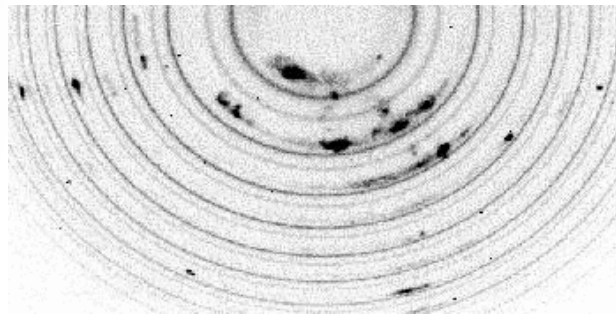


Galaxy	RA (2000)	DEC (2000)	V_{sys} , km s ⁻¹	M_B , mag	12 + log(O/H)
MCG -01-03-027	00 ^h 52 ^m 17.2 ^s	-03°58'00.0''	1412	-15.39	7.71±0.07
NGC 428	01 ^h 12 ^m 55.7 ^s	+00°58'54.0''	1152	-19.00	8.01±0.06
UGC 4117	07 ^h 57 ^m 26.0 ^s	+35°56'21.0''	773	-15.59	7.73±0.03
NGC 2552	08 ^h 19 ^m 20.1 ^s	+50°00'25.2''	524	-17.42	8.16±0.04
Mrk 407	09 ^h 47 ^m 47.6 ^s	+39°05'03.2''	1589	-12.60	7.57±0.04
UGC 5272	09 ^h 50 ^m 22.4 ^s	+31°29'16.0''	520	-15.71	7.84±0.03
UGC 5288	09 ^h 51 ^m 17.0 ^s	+07°49'39.0''	556	-15.61	7.81±0.09
IC 2520	09 ^h 56 ^m 20.1 ^s	+27°13'39.3''	1238	-17.32	7.81±0.05



Observations with scanning Fabry-Perot Interferometer

SCORPIO-2 multi-mode focal reducer with scanning FPI
(Afanasiev & Moiseev, 2011)



Data reduction:
Moiseev (2002)
Moiseev, Egorov (2008)
Moiseev (2015)

6.1x6.1 arcmin

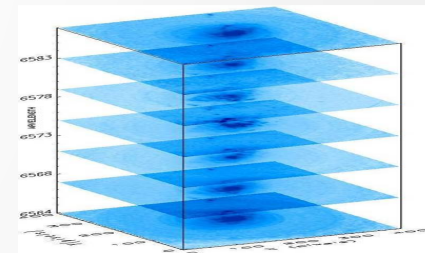
Spectral range: H α , [NII], [OIII] and [SII] emission line

Spatial sampling: 0.35-0.70 arcsec/px

Spectral resolution:

R=4000 - 15000

σ = 8.5 - 30.0 km/s



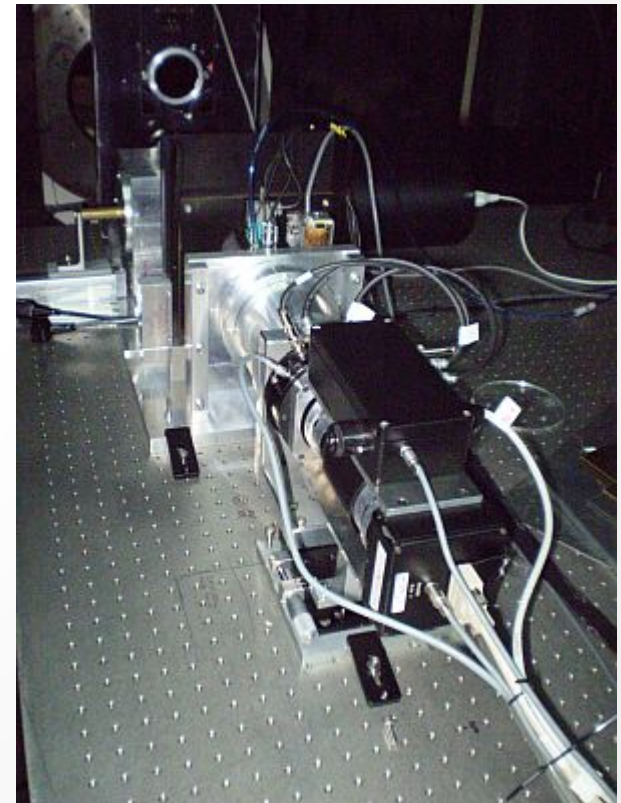
The method description: Moiseev et al., 2004; Moiseev, 2008

Observations with GhaFaS at William Herschel Telescope

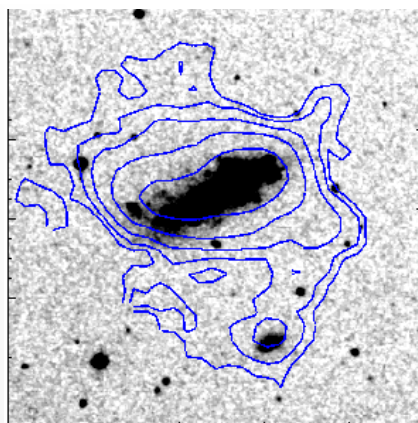
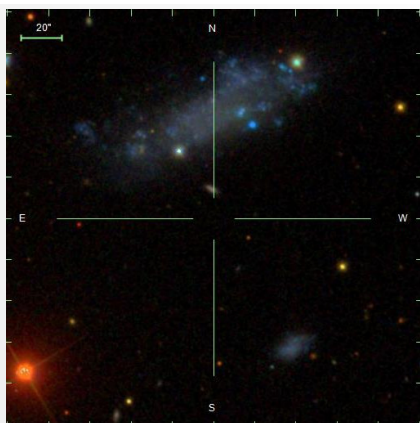
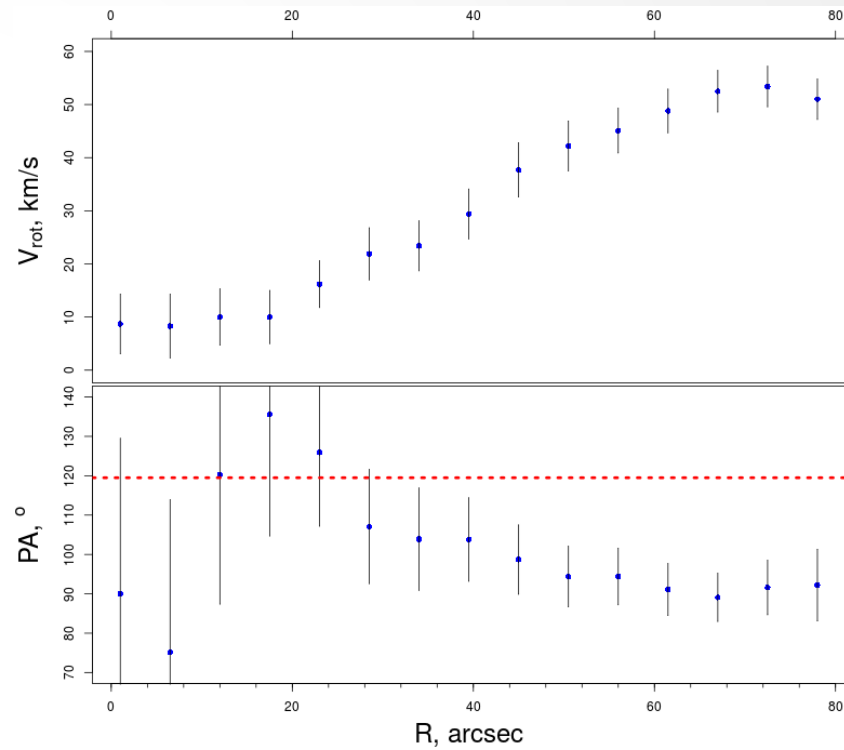
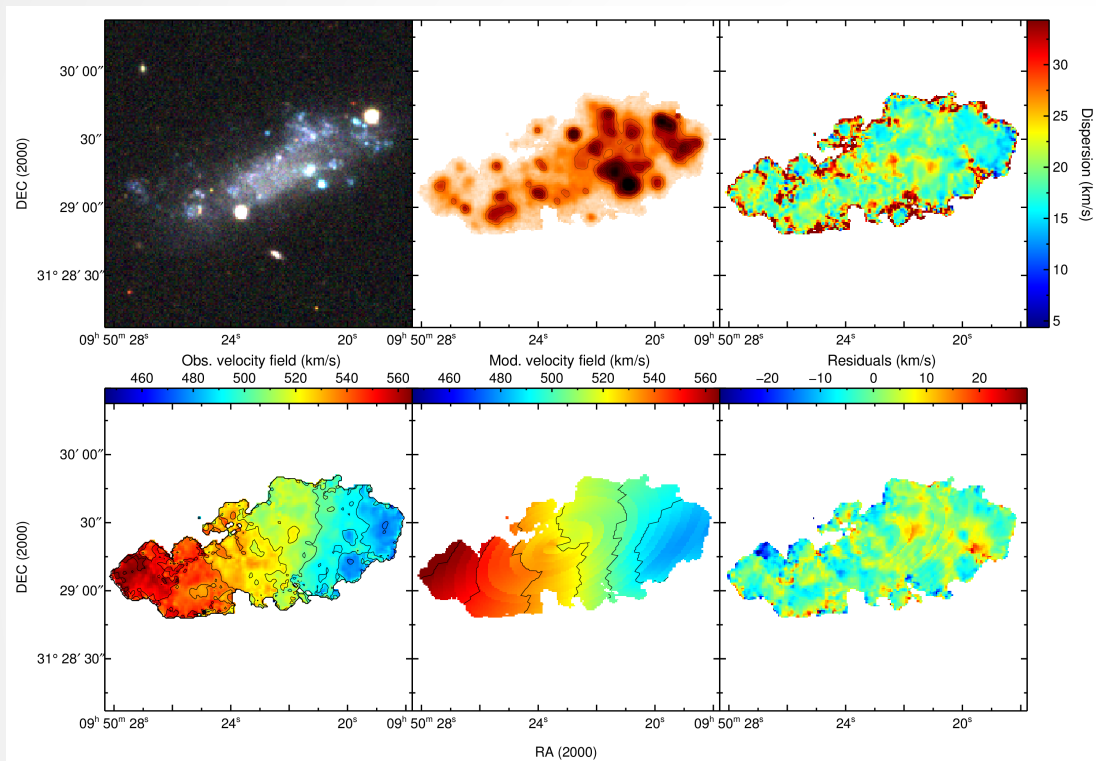


Snow art by Alexei Moiseev near WHT (4.2m)

Galaxy H α Fabry- Perot (FP) System:
202x202 arcsec
0.197-0.394 "/pixel
R~15000
Hernandez et al., PASP, 120, 665 (2008)

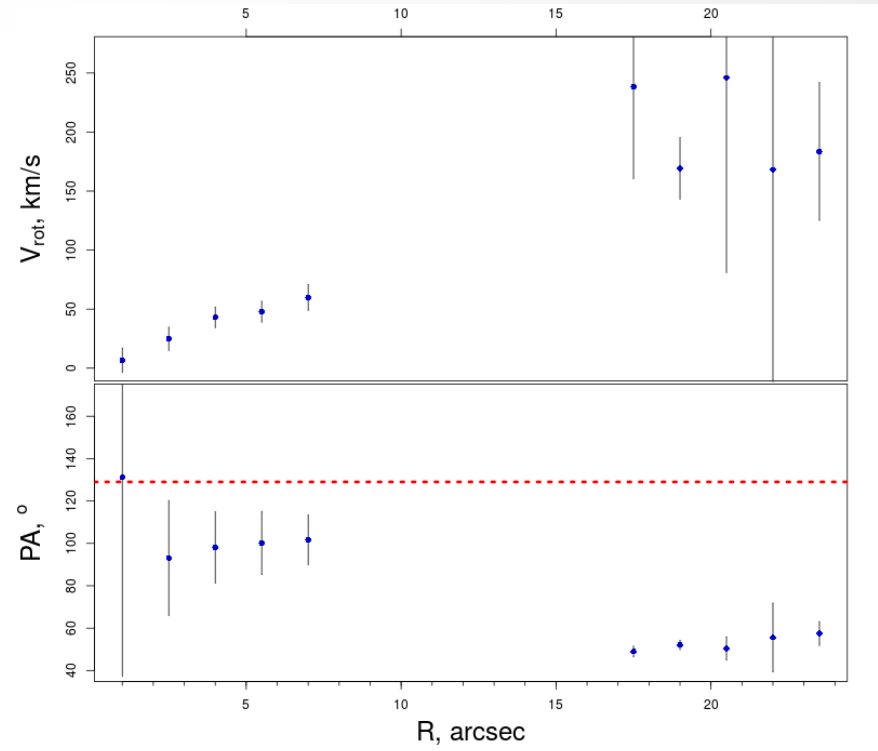
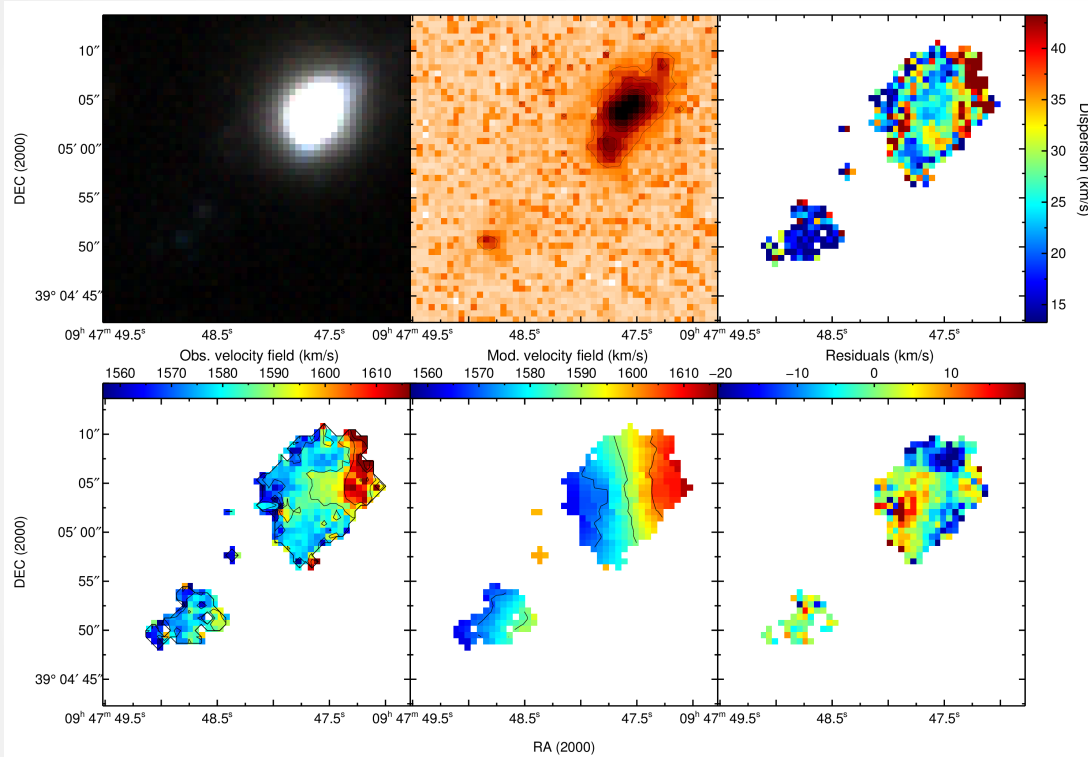


UGC5272



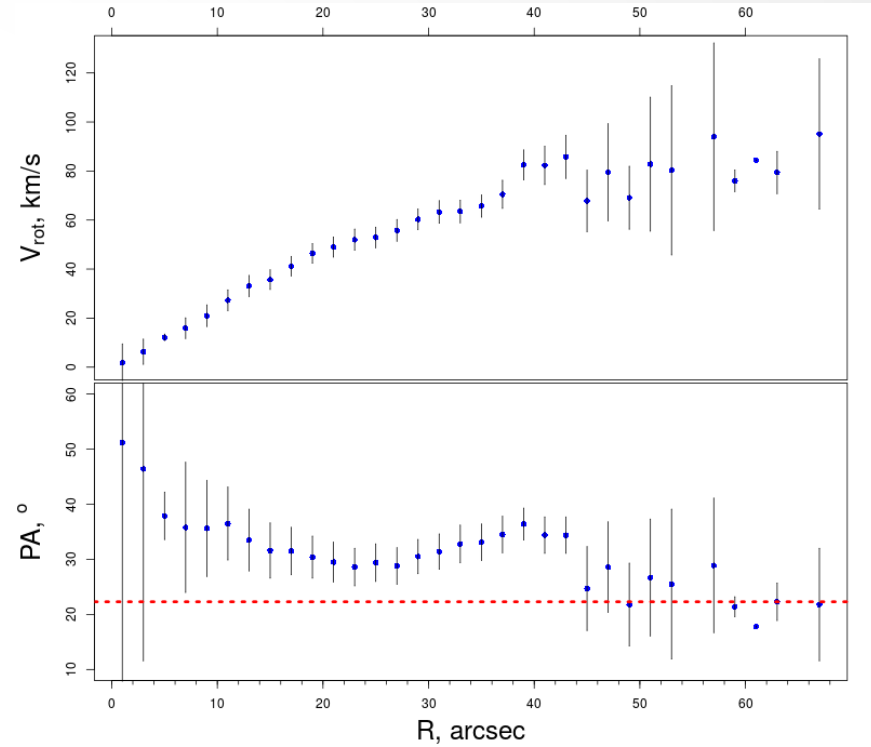
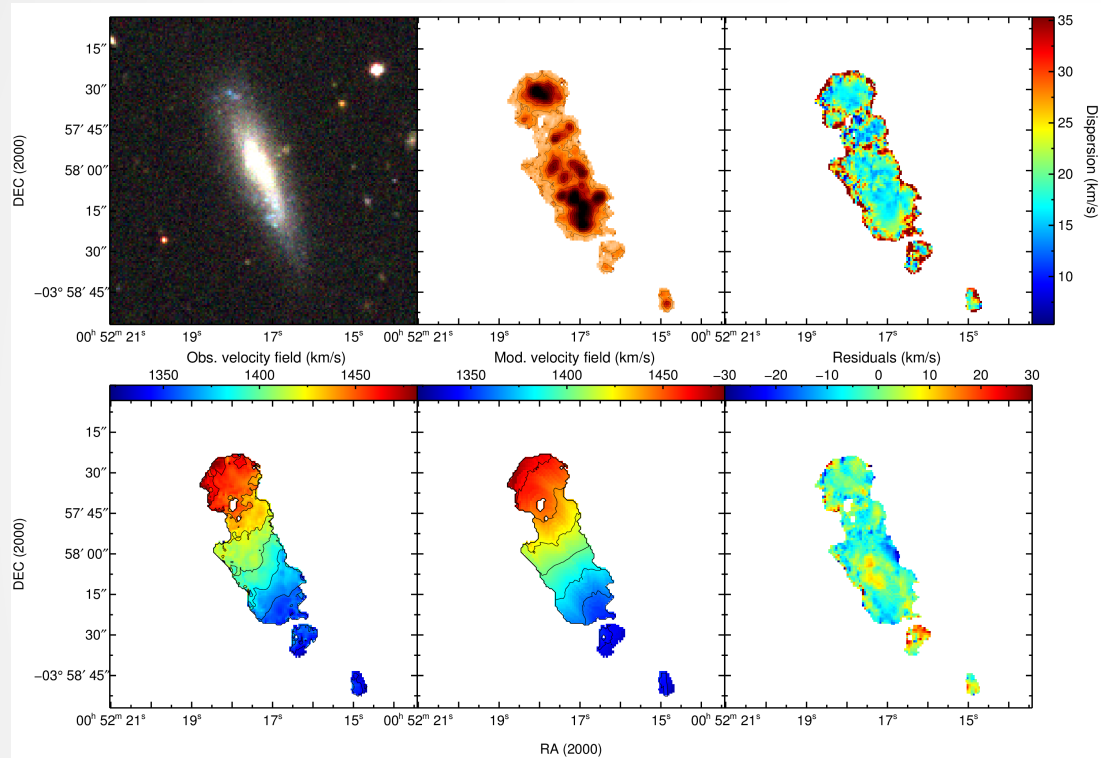
Holwerda et al 2011

MRK407



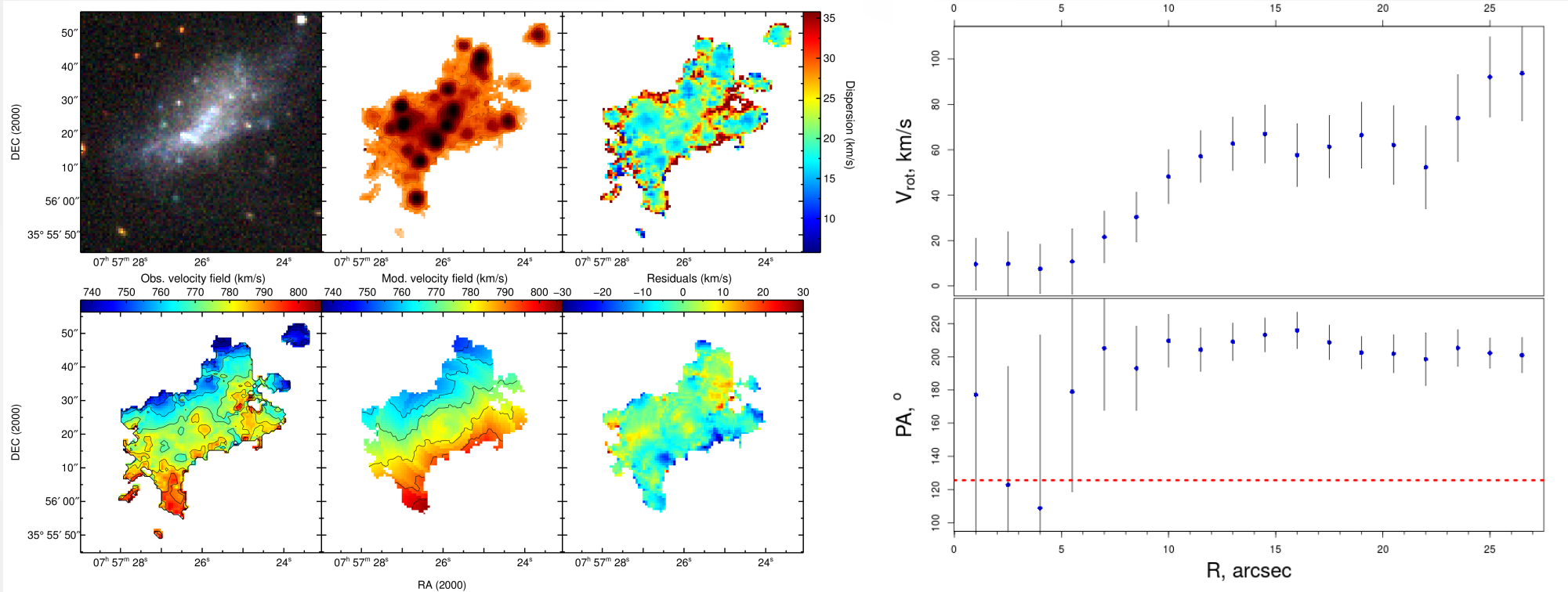
*Pustilnik, Martin, 2016
Chengalur et al, in prep.*

MCG-01-03-027



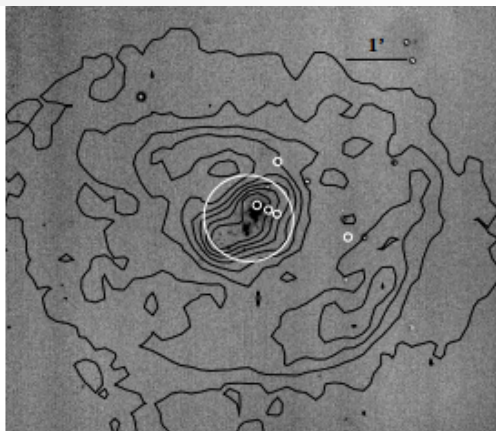
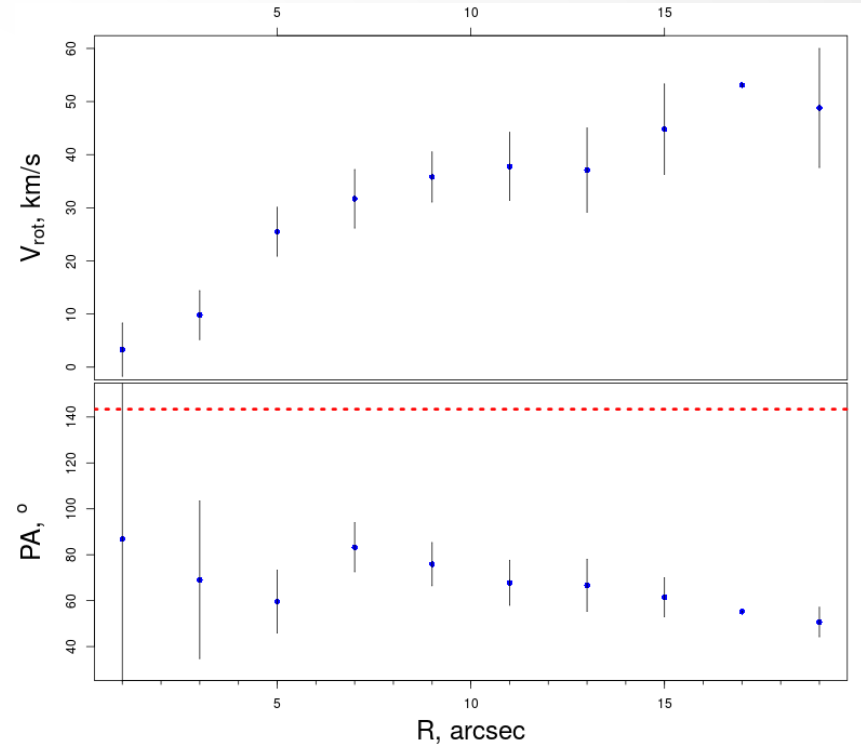
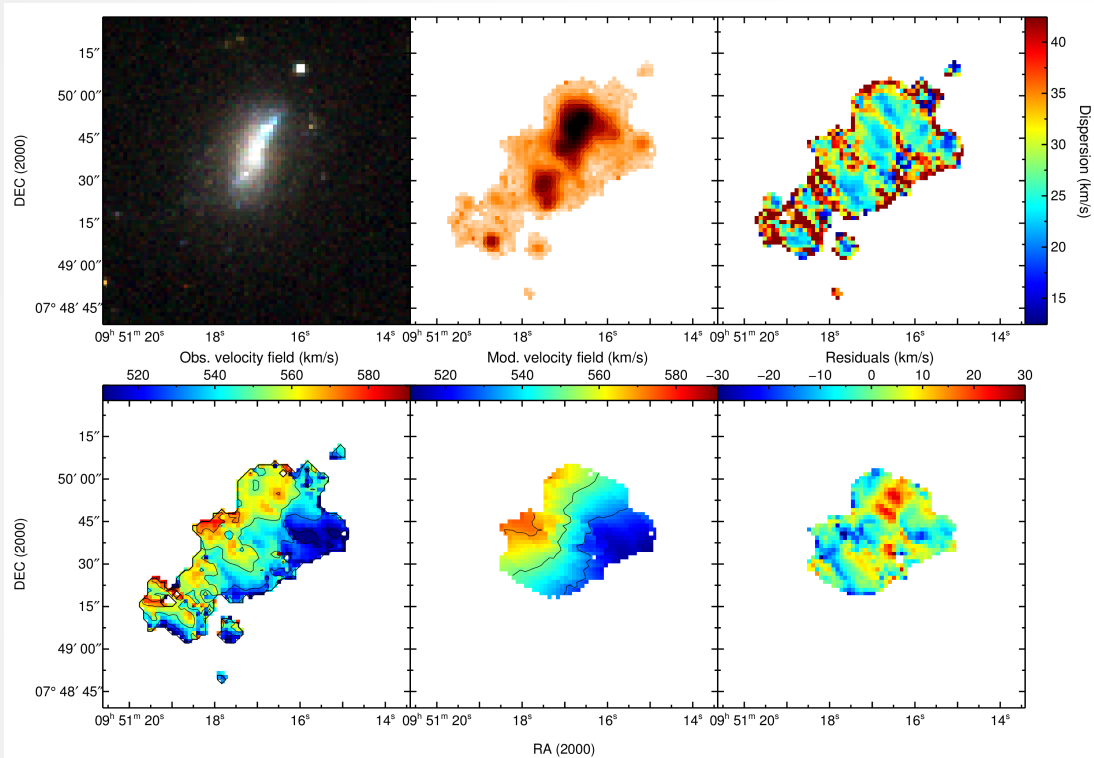
Isolated galaxy (according to Karachentsev et al, 2011);
reveals unperturbed ionized gas kinematics

UGC4117



Isolated galaxy (according to Karachentsev et al, 2011); reveals strong misalignments between optical morphology and ionized gas kinematics

UGC5288



(1) UGC 5288; with HI contours at 0.25 to $6.0 M_{\odot} \text{pc}^{-2}$

Isolated (according to Karachentsev et al, 2004)

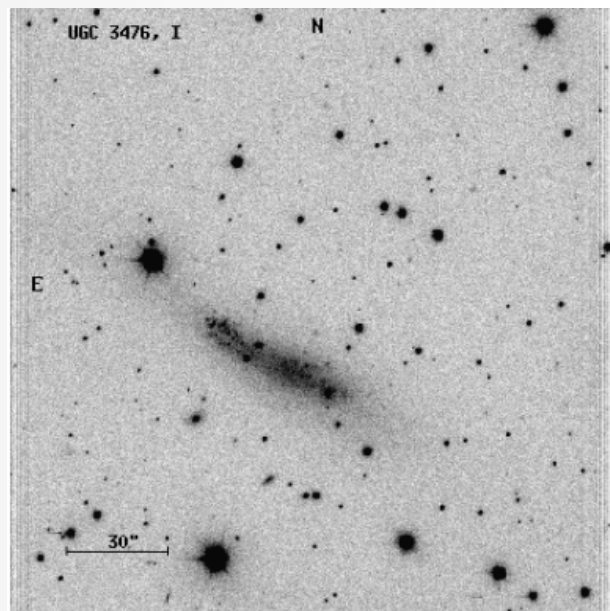
Van Zee, 2004:

(...) the optical morphology of UGC 5288 is highly suggestive of a bar-like object embedded in an extended, low density, gaseous disk.

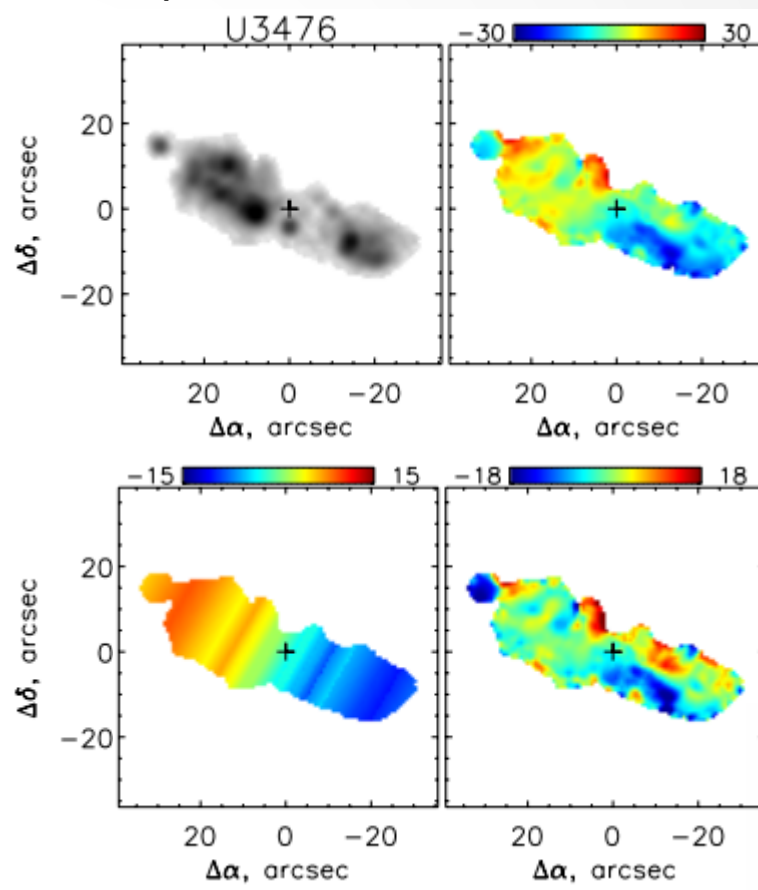
Werk et al 2001

UGC3476

Isolated (according to Karachentsev et al 2011)



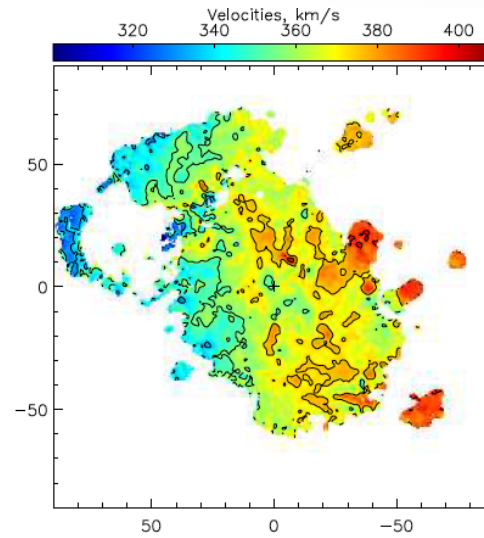
Makarova, Karachentsev, 1998



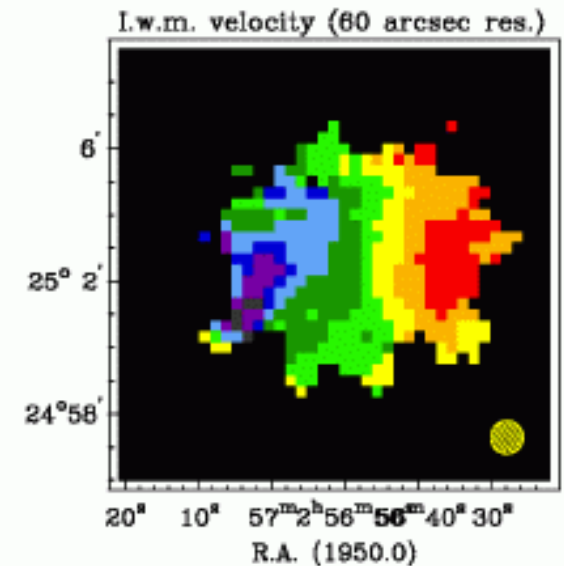
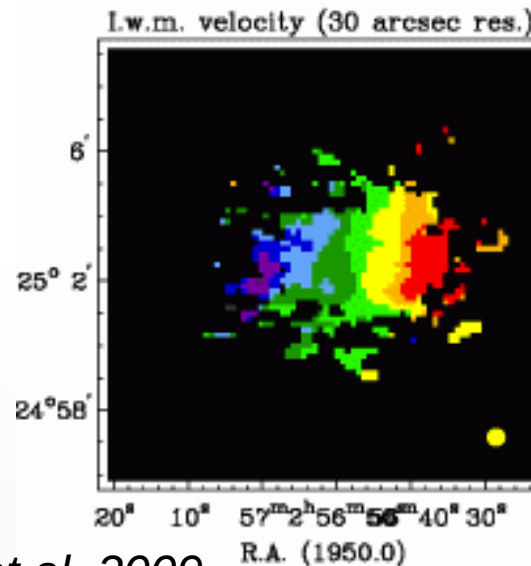
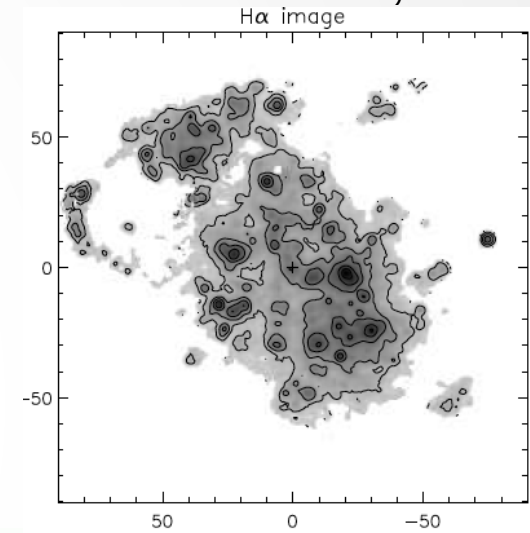
Moiseev, 2014

NGC1156: Stellar bar in HI disk?

Isolated (according to Karachentsev et al 2011)



Moiseev et al, 2015



Swaters et al, 2009

Summary

We compiled a sample of void galaxies with signs of disturbances that might be caused by interactions or by accretion

The observations with scanning Fabry-Perot interferometer for 8 sample galaxies were performed

In most of the observed objects (including two isolated galaxies) we observe non-circular motions that might be caused by the accretion of external gas or by tidal disturbance

Plans and prospects

To study the nature of isolated galaxies that reveal strong misalignment between optics and kinematics we need information on HI morphology and kinematics

For better understanding of gas accretion events onto void galaxies we need data on metallicity distribution in studied objects

We plan to extend our sample for FPI observations