HST/COS Observations of the Warm Ionized Gaseous Halo of NGC 891

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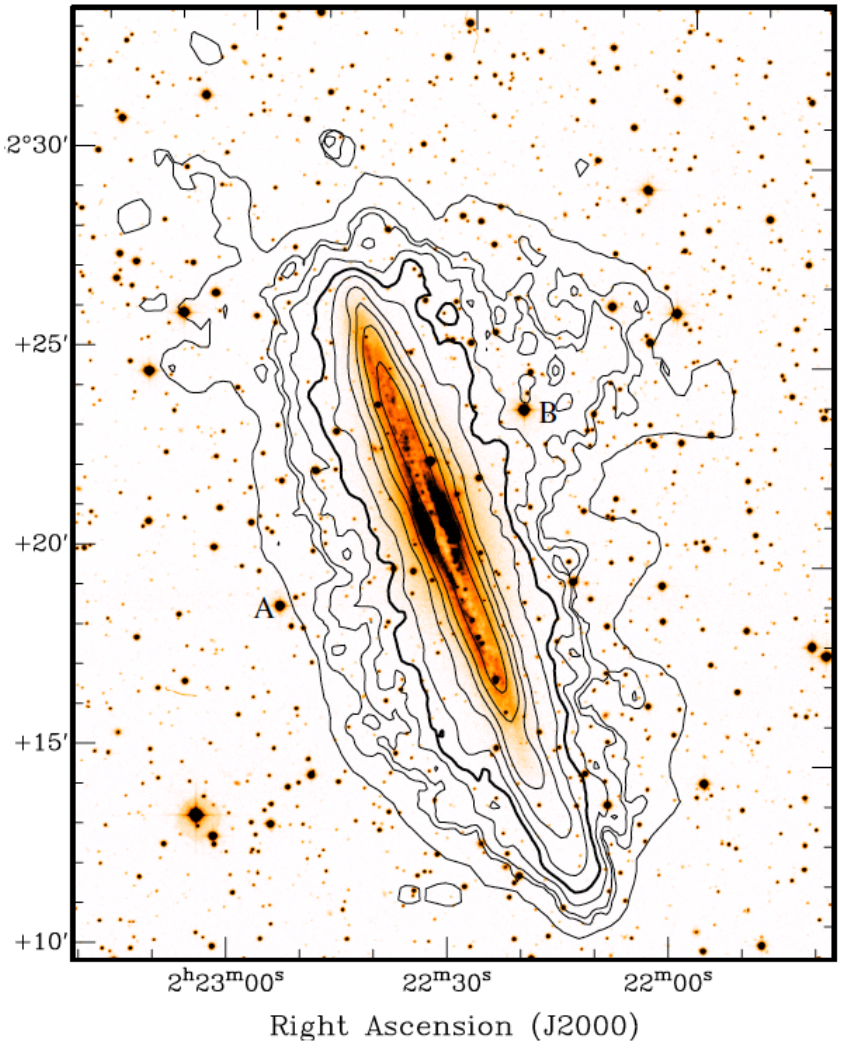
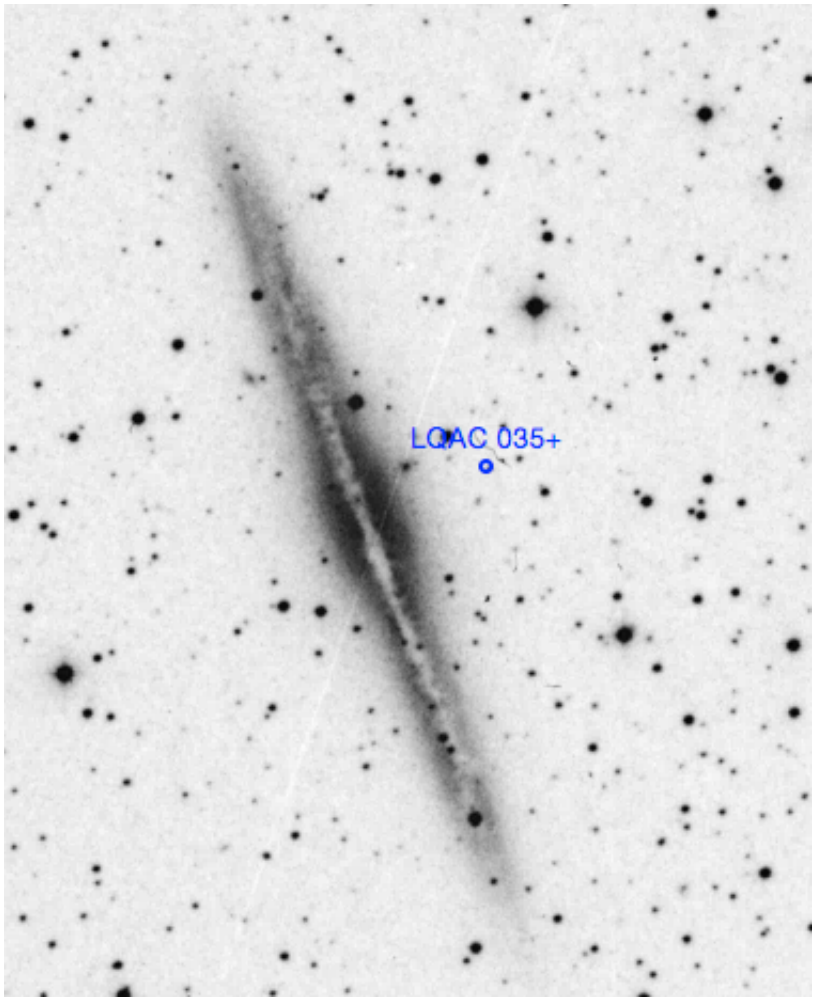


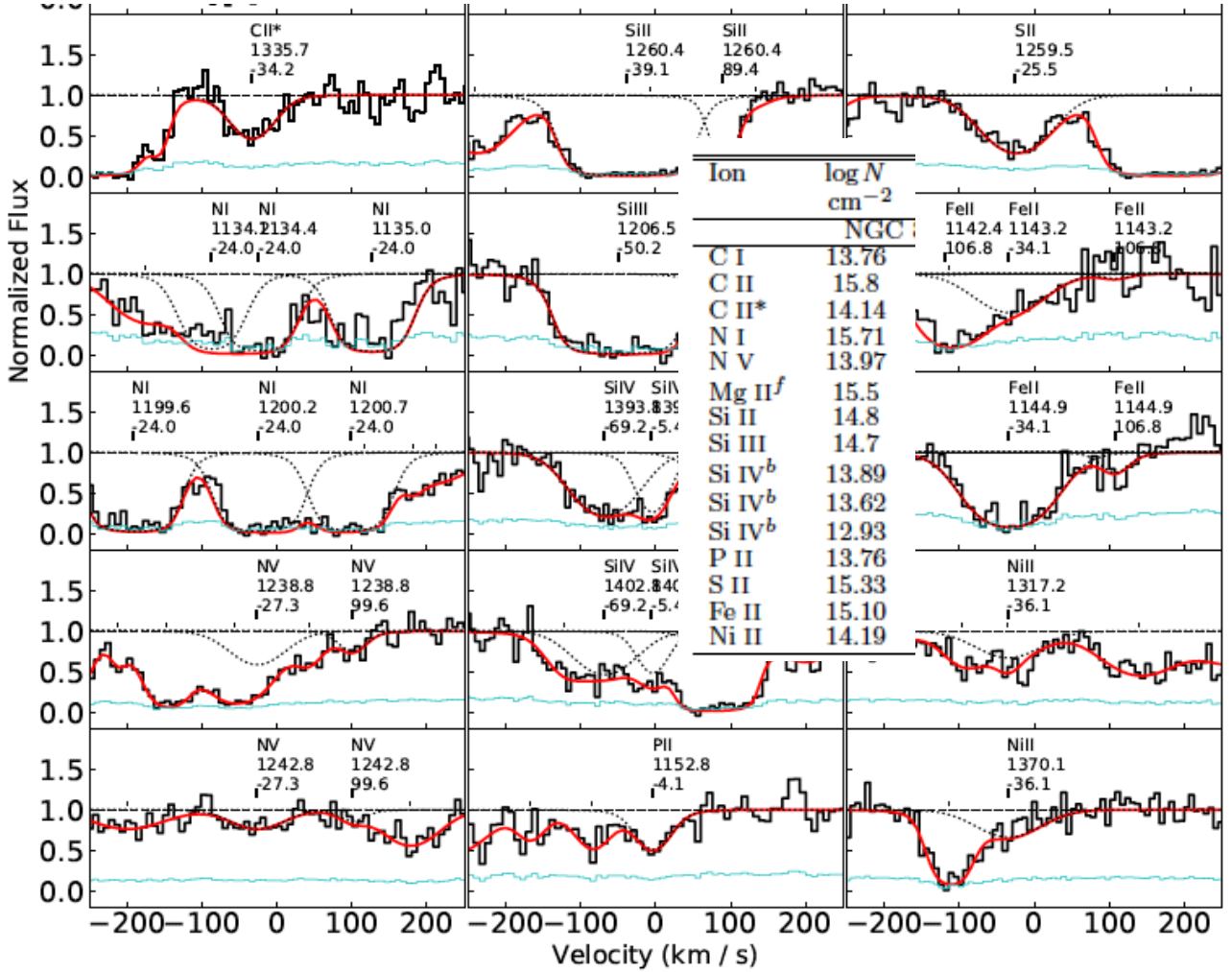
HI: Oosterloo, Fraternali & Sancisi 07

LQAC 035+042 003 - 5 kpc above the disk



HST/COS spectra FUV (R~20 000) + NUV (R~2500) Jul-Aug 2013

13 ions, 8 elements (C, N, Mg, Si, P, S, Fe, Ni)
Main component (V=-30 km/s) + HVC (+100 km/s)



Ion	log N cm^{-2}
	NGC
C I	13.76
C II	15.8
C II*	14.14
N I	15.71
N V	13.97
Mg II[f]	15.5
Si II	14.8
Si III	14.7
Si IV[b]	13.89
Si IV[b]	13.62
Si IV[b]	12.93
P II	13.76
S II	15.33
Fe II	15.10
Ni II	14.19

Ion	log N cm^{-2}	$\sigma_{\log N}$ dex	b km s^{-}	
	NGC 891 (LQAC 035+			
C I	13.76	0.17	23.5	1
C II	15.8	>	...	
C II*	14.14	0.05	33.3	
N I	15.71	0.10	34.1	
N V	13.97	0.10	42.8	1
Mg II[f]	15.5	<	...	
Si II	14.8	>	...	
Si III	14.7	>	...	
Si IV[b]	13.89	0.08	48.1	
Si IV[b]	13.62	0.16	22.4	
Si IV[b]	12.93	0.31	32.5	2
P II	13.76	0.09	25.1	
S II	15.33	0.02	50.9	
Fe II	15.10	0.04	55.1	
Ni II	14.19	0.06	53.0	1
		NGC 891 HVC		
C I[c]	13.66	0.23	7.3	1
C II	13.97	0.18	10.0	
N I[f]	13.8	<	...	
N V	13.47	0.15	19.7	1
Si II	13.50	0.08	14.8	
Si III[e]	13.1	>	...	
Si IV[f]	12.5	<	...	
Fe II	13.77	0.18	20.0	

FIG. 1.— The spectra and best-fit models for identified lines for NGC 891. The black histograms are the observed spectrum, while the cyan lines are the error. The red solid lines are the total model for all identified lines, while the black dotted lines are decomposed spectral lines associated with NGC 891. The label for each identified line is the ion, the wavelength and the velocity relative to $z = 0.001761$.

Сравнение с HI (21 см), и L-alpha, фотоионизационные модели – очень подробно

Main component: $\log T = 4.22 \pm 0.04$, $\log n_{\rm H} = -1.26 \pm 0.51$, $\log N_{\rm H} = 20.81 \pm 0.20$.
size~4 kpc, [X/H]=-0.3+-0.3, выше, чем по Xray:[Fe/H], [O/H=-0.85
=> это смесь газа диска и горячего гало
Не аккреция (высока металличность), авторы склоняются: что это скорее outflow, чем просто вращение, сравнивая с HI (скорости не идеально совпадают, дисперсия скоростей довольно велика b~50 km/s)

Большая часть газа гало – в ионизованной фазе: N(HI+HII)/N(HI)=5-10

High Velocity Cloud: $\log N_{\rm H} = 19.71 \pm 0.36$, $\log n_{\rm H} = -3.0 \pm 0.3$

[X/H]=-1.5 (C,Si, Fe) => холодная аккреция (спутник?)
L~5.5 kpc, Log M ~5.0

Оценки числа таких гало, темпа акреции:

radius) or $\log M/M_\odot = 4.6$ at 10 kpc. Then, the accretion rate from this cloud is around $6.8 \times 10^{-3} M_\odot$ yr^{-1} or $9.2 \times 10^{-4} M_\odot$ yr^{-1} assuming the infall velocity of 200 km s^{-1}. The number of such clouds within each radius is estimated assuming the volume filling factor of HVC is $\approx 2\%$ (Richter 2012) which leads to 2.0×10^2 or 2.8×10^1 clouds within 10 kpc or 19 kpc. Finally, the accretion from the HVC is $0.2 M_\odot$ yr^{-1} in both cases,

А еще лацертид 3C 66A в 41 arcmin (108 kp)

Система + 30 км/с, но, скорее всего, это карликовые спутники:

“ GSC2.3 NCIA030805 is found to have a projected distance of 31.2 kpc from 3C 66A, and 95.5 kpc from NGC 891. UGC 1807 (or GSC2.3 NBZ5012371), which is projected 59.8 kpc away from 3C 66A and 75.9 kpc from NGC 891. This galaxy is believed to be within the virial radius of NGC 891, based on leading interaction features on the H I disk (Mapelli et al. 2008). ”