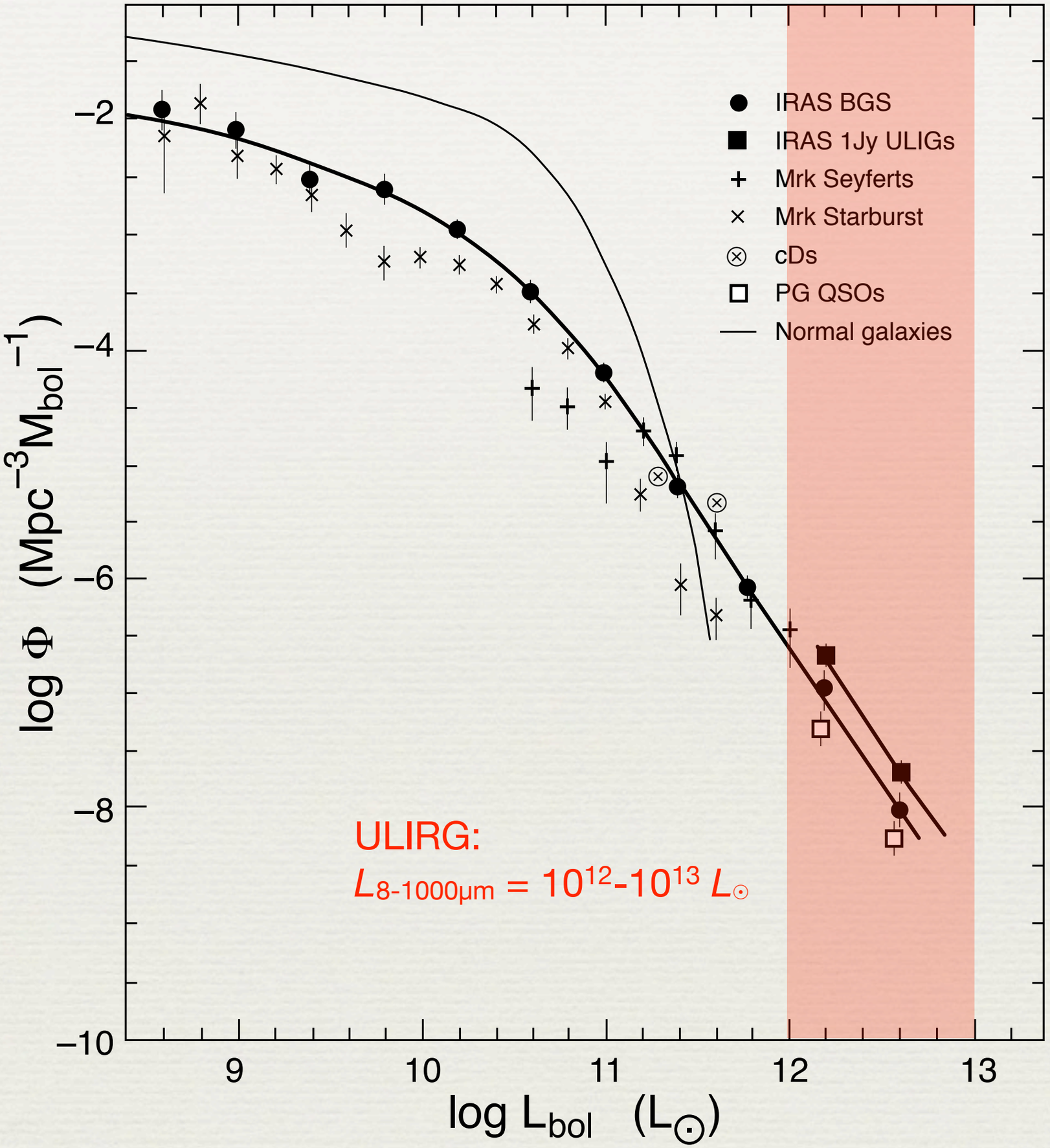
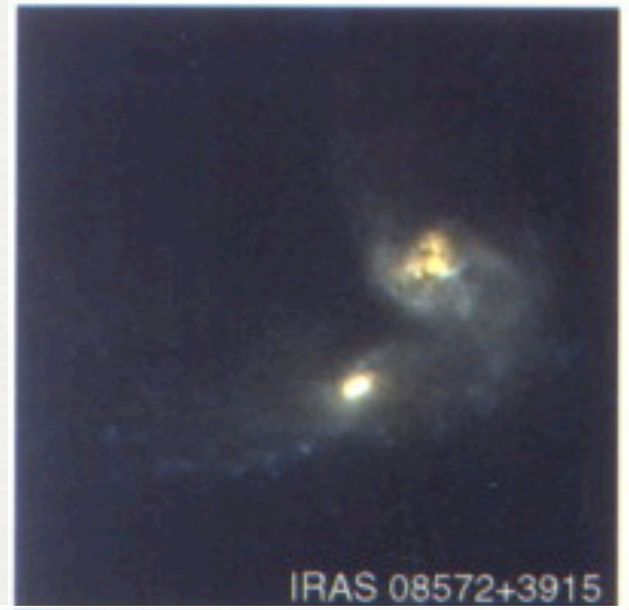
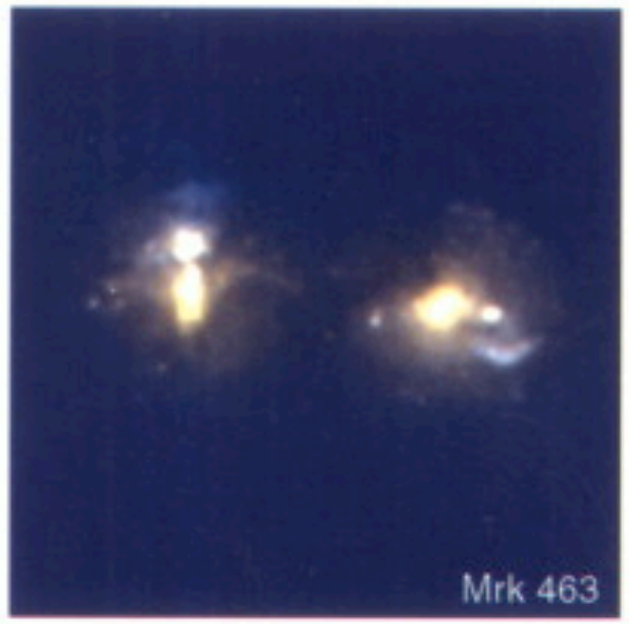
Ionized vs. molecular gas feedback in local ULIRGs

Mark Westmoquette
ESO Garching


IRAS BGS
IRAS 1Jy ULIGs
Mrk Seyferts
Mrk Starburst
cDs
PG QSOs
Normal galaxies
ULIRG:
$L_{8\text{-}1000\mu m} = 10^{12}\text{-}10^{13}\ L_\odot$
log Φ (Mpc^{-3}M$_{bol}^{-1}$)
log L$_{bol}$ (L$_\odot$)
−2
−4
−6
−8
−10
9
10
11
12
13


IRAS 08572+3915

IRAS 12071-0444


Mrk 463

VLT/VIMOS-IFU

Galaxy	α (J2000), δ (J2000)	z^a	D^a (Mpc)	$\log(L_{\rm IR}/L_\odot)^b$	Sp type^c
IRAS 00198-7926	00 21 52.9, −79 10 08.0	0.0728	300	12.01	Sy2 (AGN in northern nucleus^e)
IRAS 00335-2732	00 36 00.5, −27 15 34.5	0.0693	282	11.93	SB
IRAS 03068-5346	03 08 21.3, −53 35 12.0	0.0745	304	11.96	SB
IRAS 05189-2524	05 21 50.5, −25 21 46.3	0.0426	173	12.19	Sy2
IRAS 06035-7102	06 05 11.2, −71 03 05.5	0.0795	325	12.26	SB (outflow suggests AGN^e)
IRAS 09111-1007W	09 13 38.8, −10 19 20.3	0.0541	220	11.98	SB+Sy2
IRAS 12112+0305	12 13 46.0, +02 48 38.0	0.0733	300	12.28	LINER
IRAS 14348-1447	14 37 38.4, −15 00 22.8	0.0827	345	12.30	LINER (SW nucleus Sy2^f)
IRAS 14378-3651	14 40 58.9, −37 04 33.0	0.0676	280	12.24	LINER+Sy2
IRAS 17208-0014	17 23 21.9, −00 17 00.4	0.0428	175	12.25	SB (LINER^g)
IRAS 19254-7245	19 31 21.6, −72 39 21.7	0.0617	250	11.91	Sy2
IRAS 19297-0406	19 32 20.7, −04 00 06.0	0.0857	353	12.36	SB
IRAS 20046-0623	20 07 19.4, −06 14 26.0	0.0844	348	11.97	SB
IRAS 20414-1651	20 44 18.2, −44 33 37.7	0.0871	358	12.26	SB
IRAS 20551-4250	20 58 27.4, −42 39 03.1	0.0428	175	11.98	Sy2^h
IRAS 21504-0628	21 53 05.5, −06 14 49.9	0.0776	320	11.92	Sy2?
IRAS 22491-1808	22 51 49.3, −17 52 23.4	0.0778	320	12.09	SB
IRAS 23128-5919	23 15 47.0, −59 03 16.9	0.0446	182	11.96	SB+Sy2

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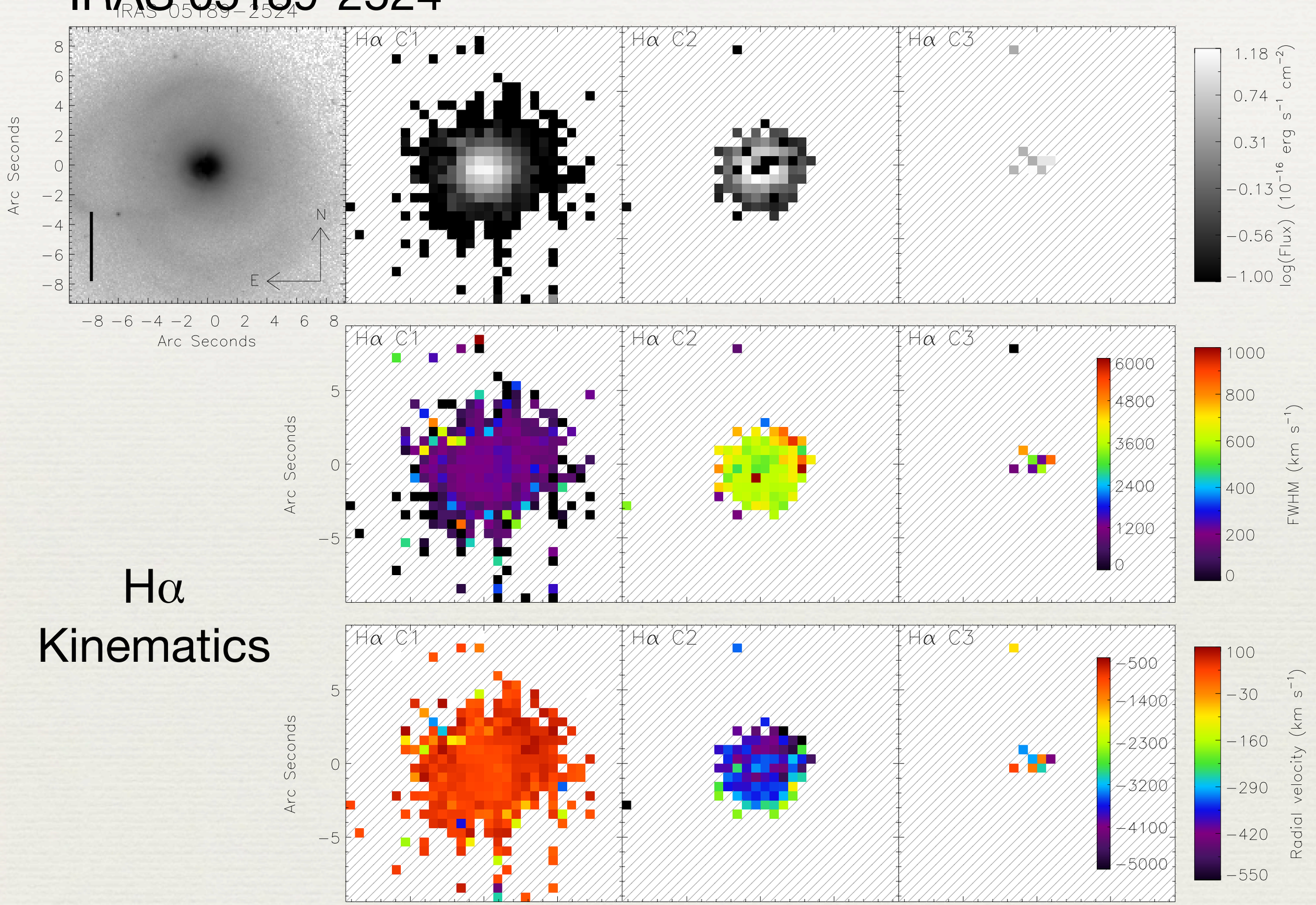
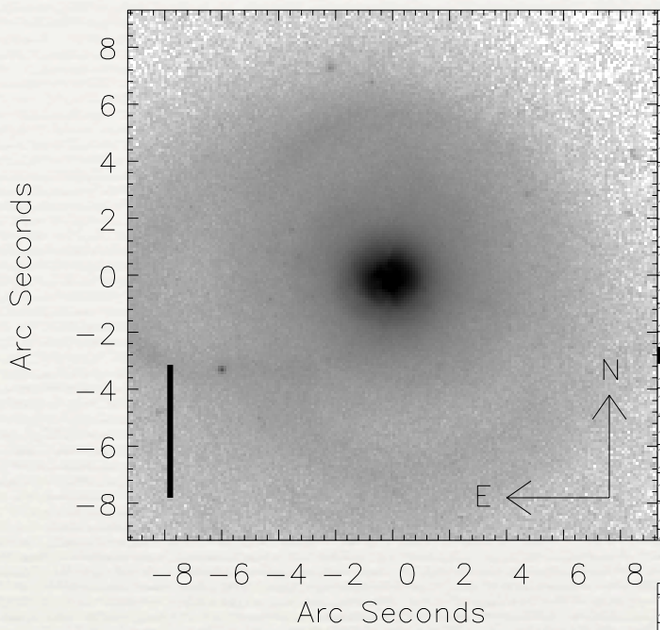
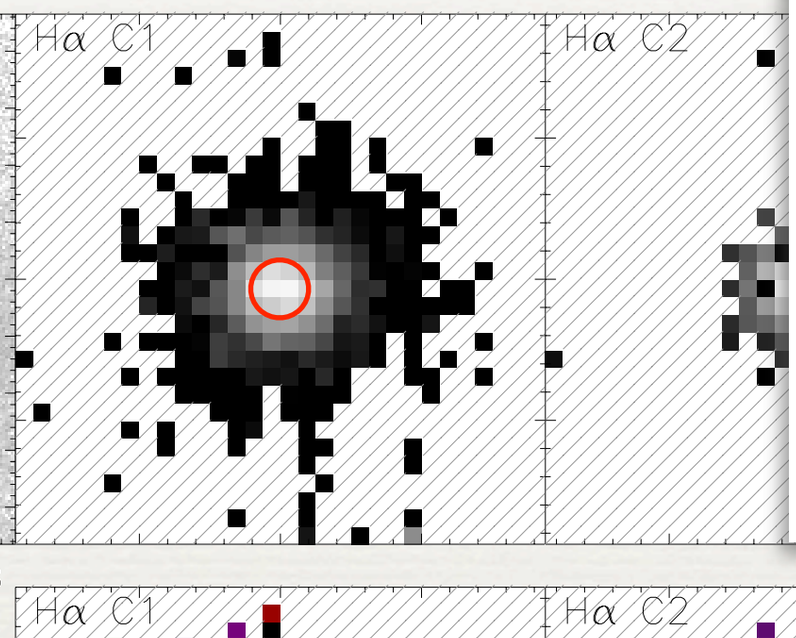
IRAS 05189-2524

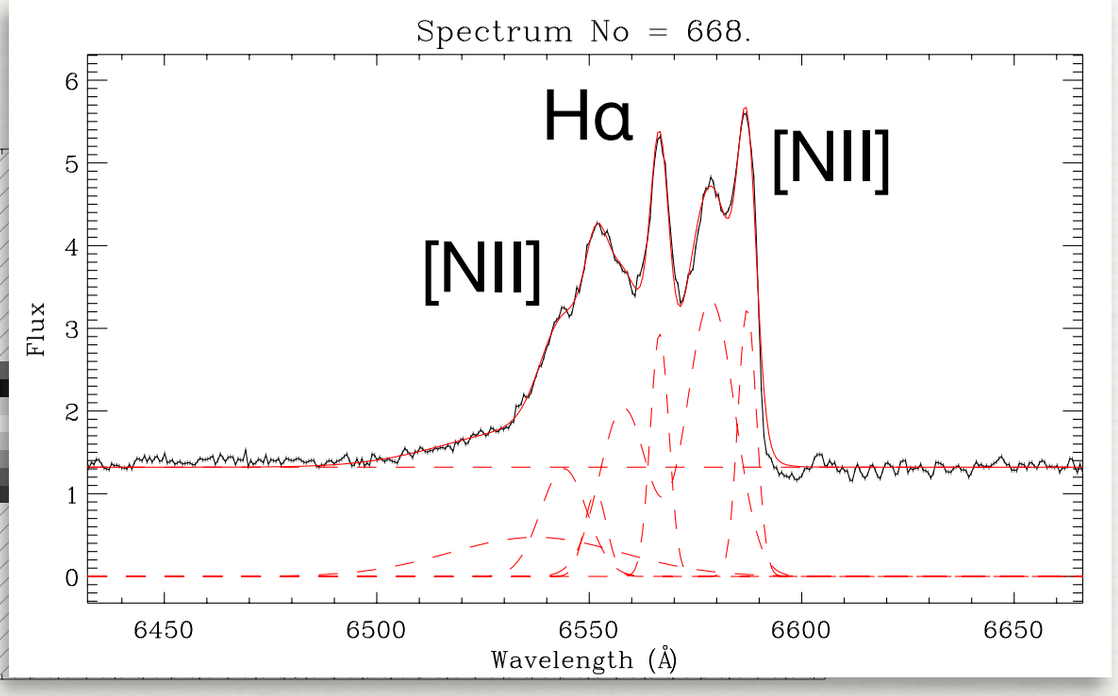
Hα Kinematics



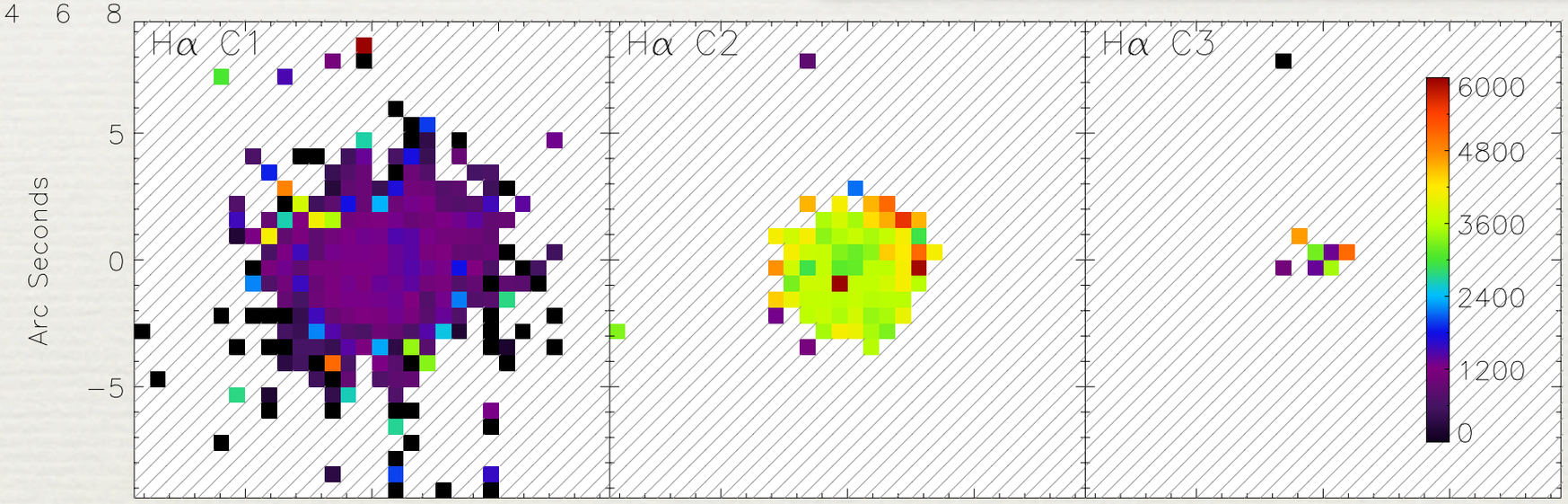
IRAS 05189-2524

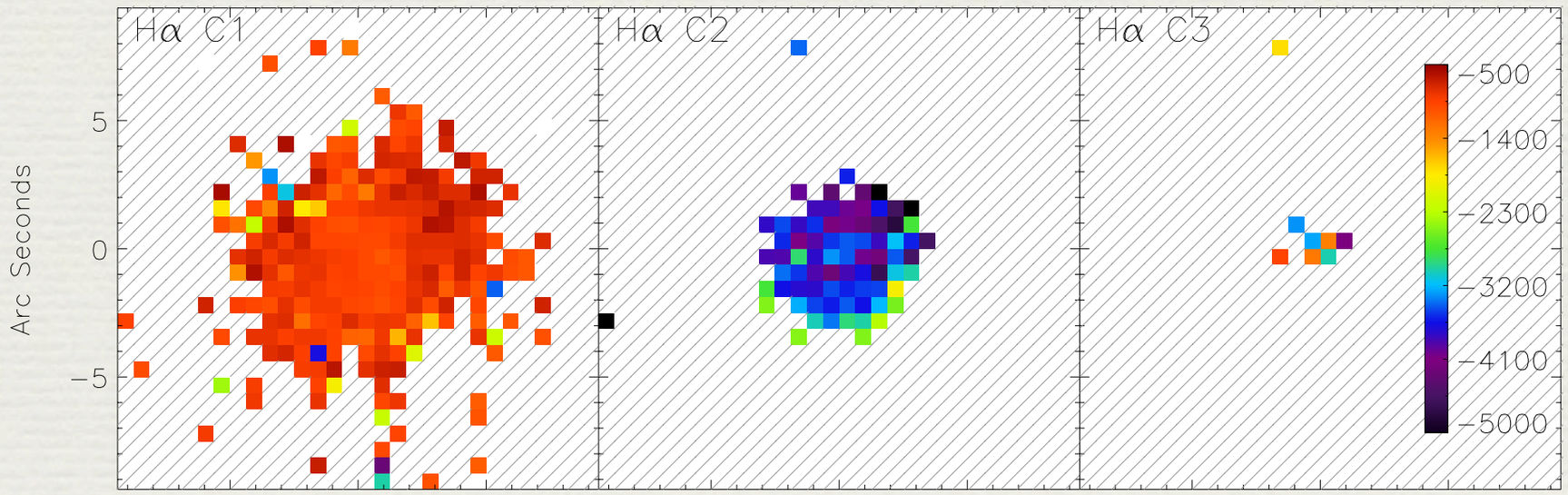




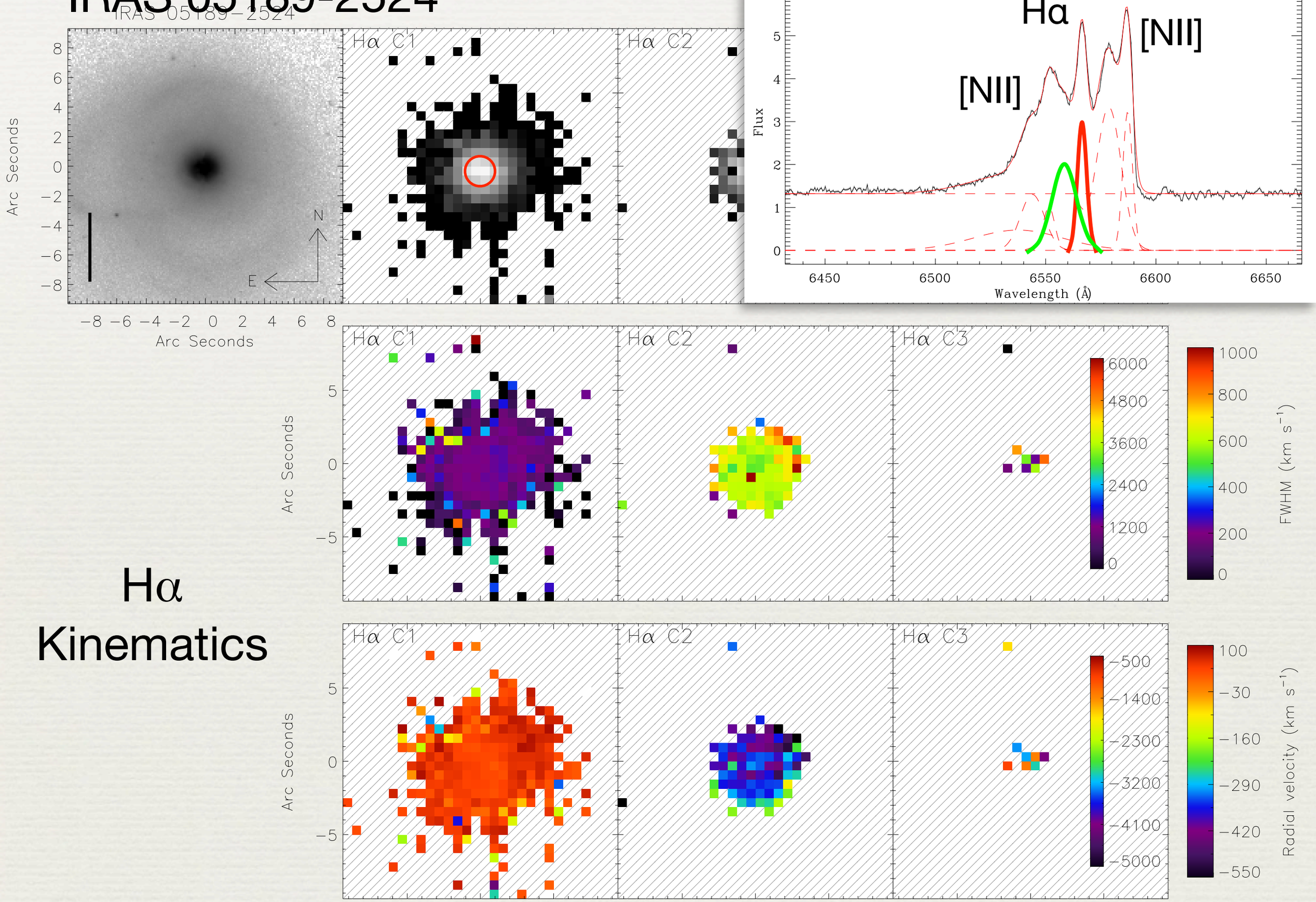


Hα Kinematics





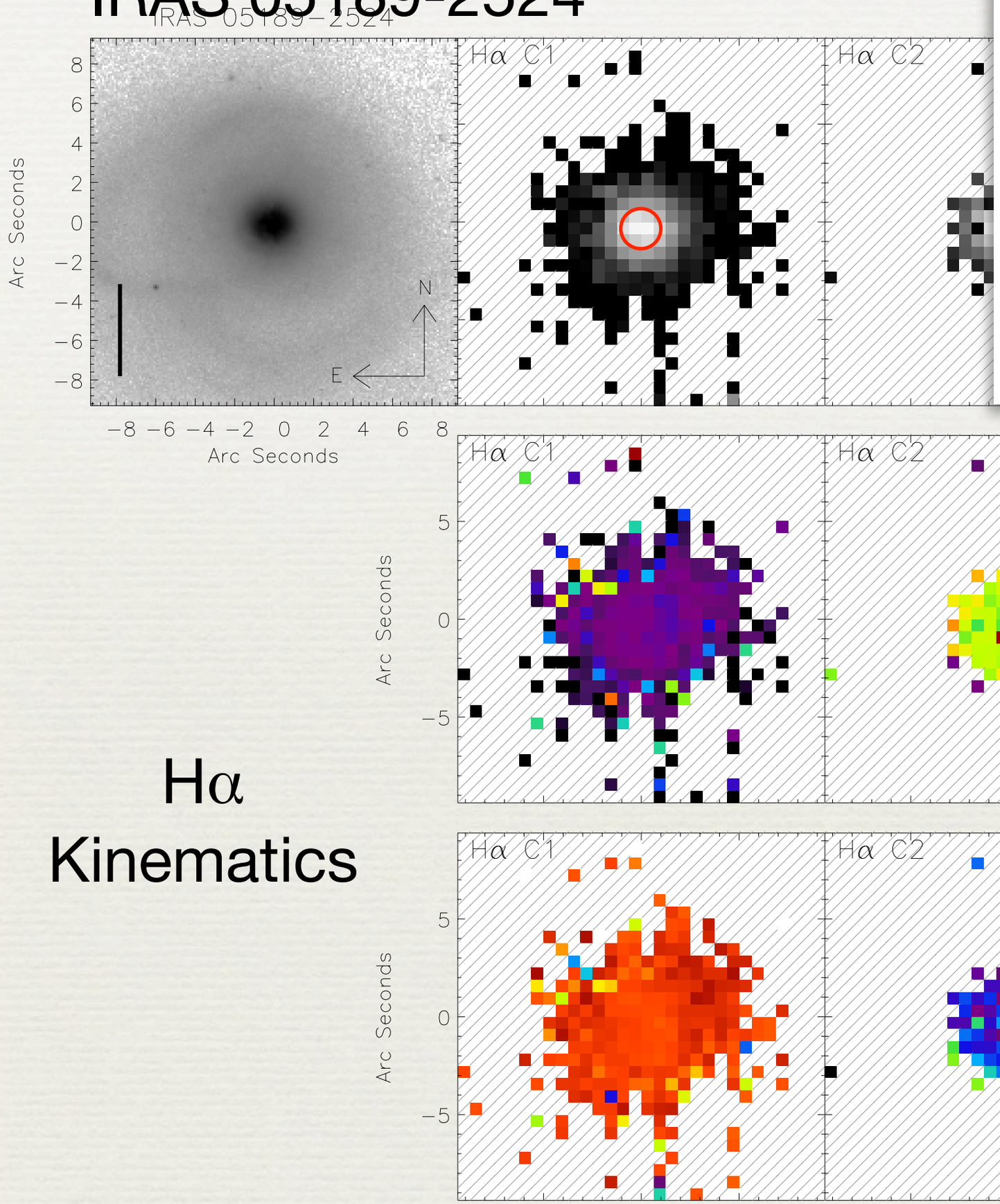
IRAS 05189-2524

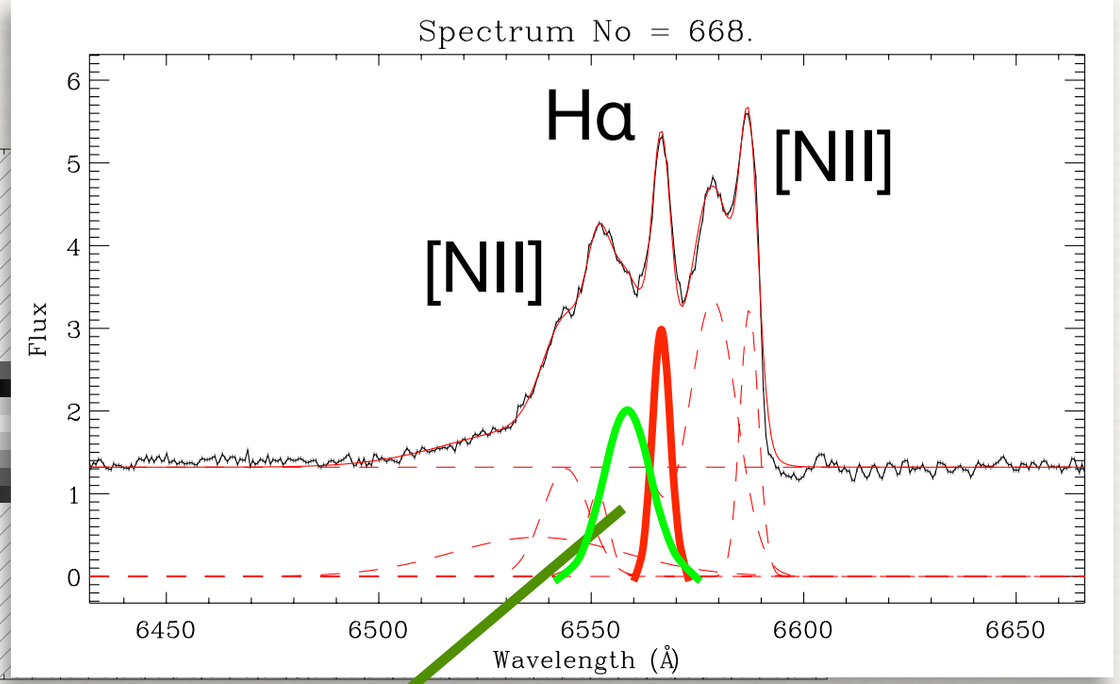


Hα Kinematics

IRAS 05189-2524

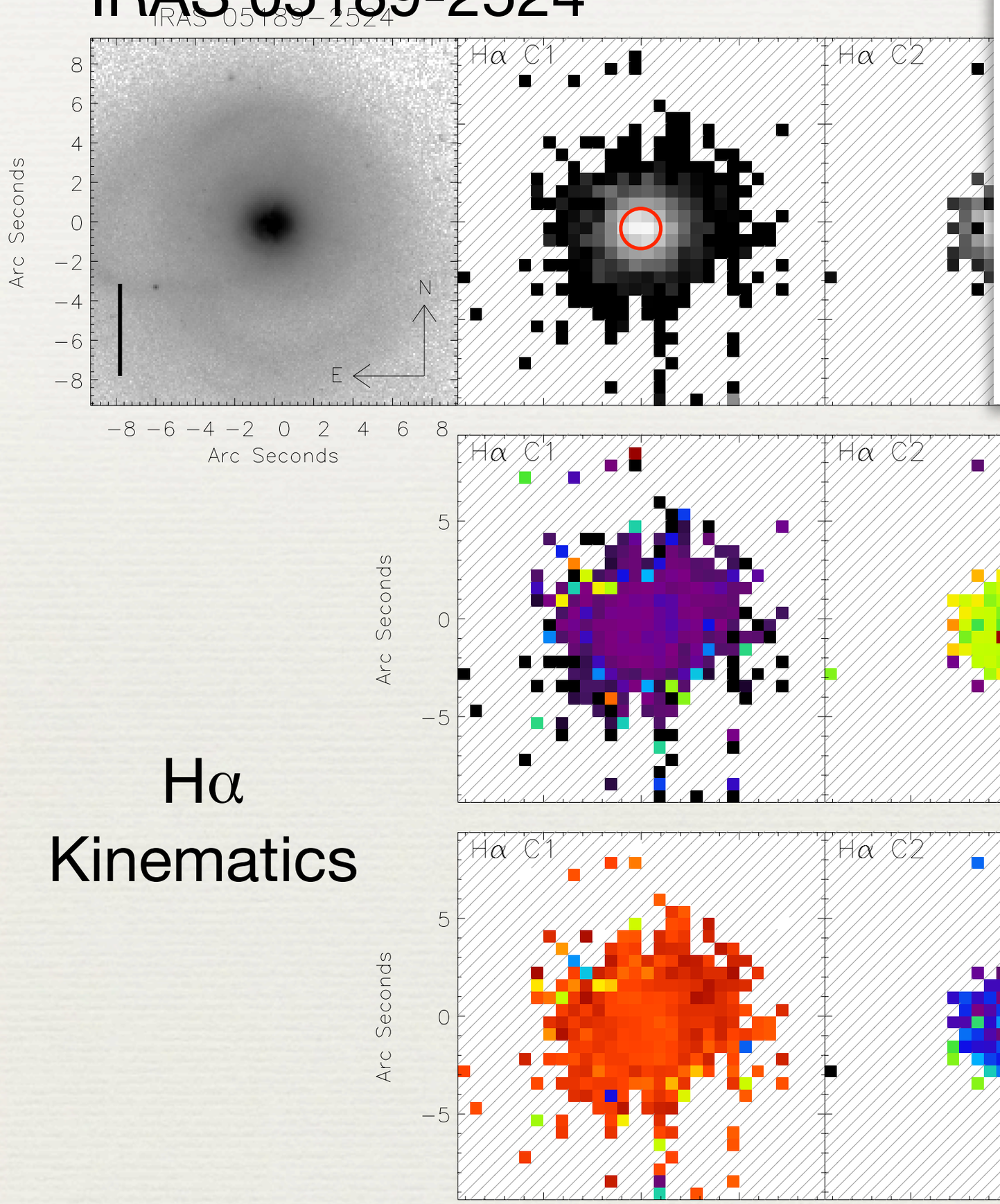
Hα Kinematics

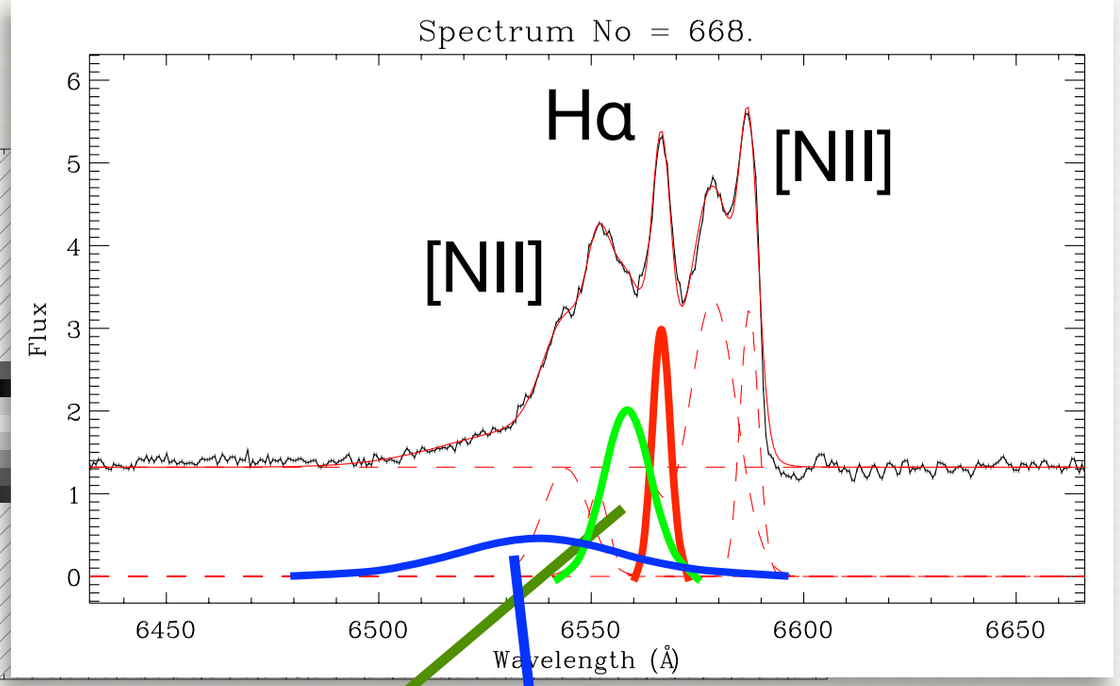




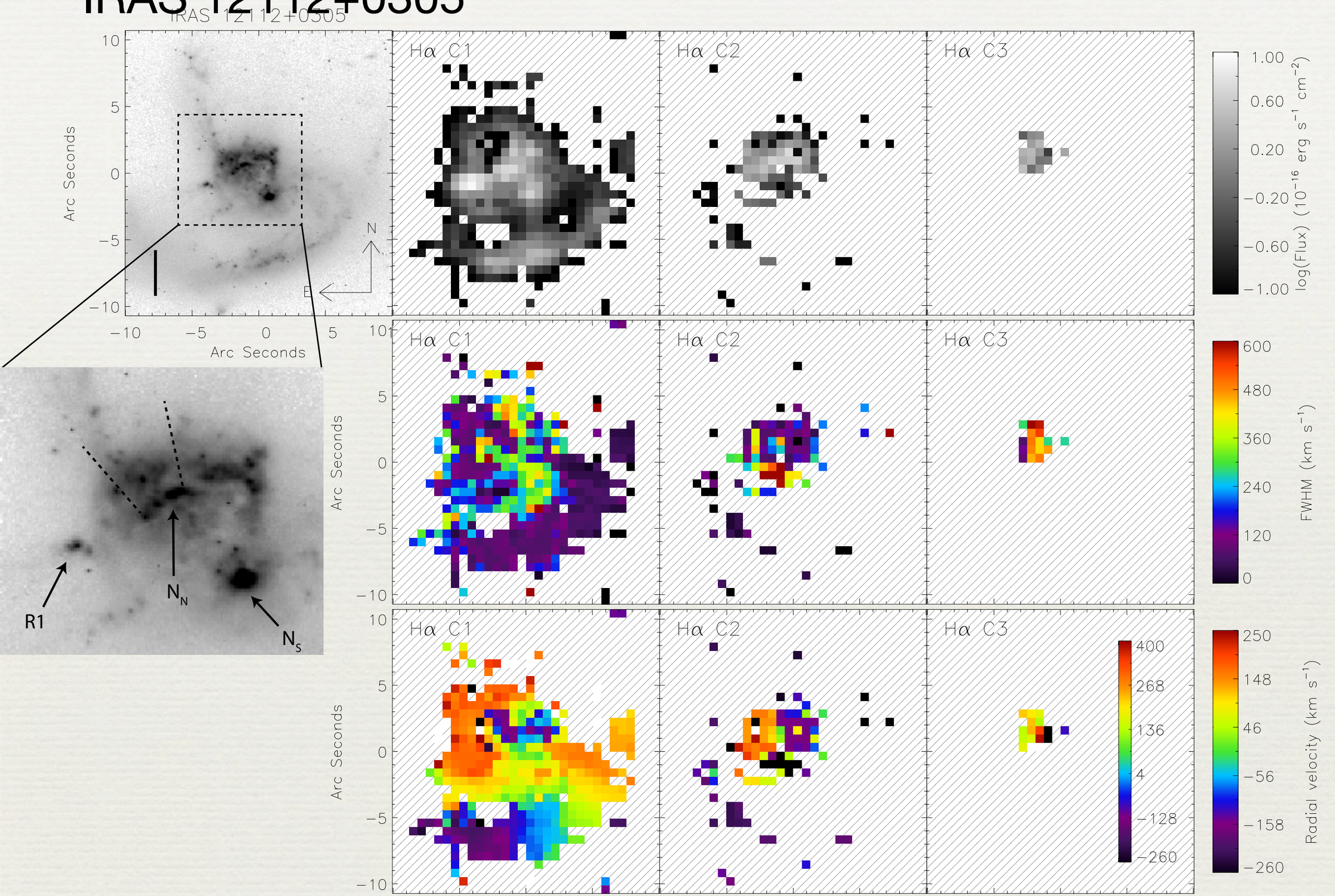
IRAS 05189-2524

Hα Kinematics





IRAS 12112+0305



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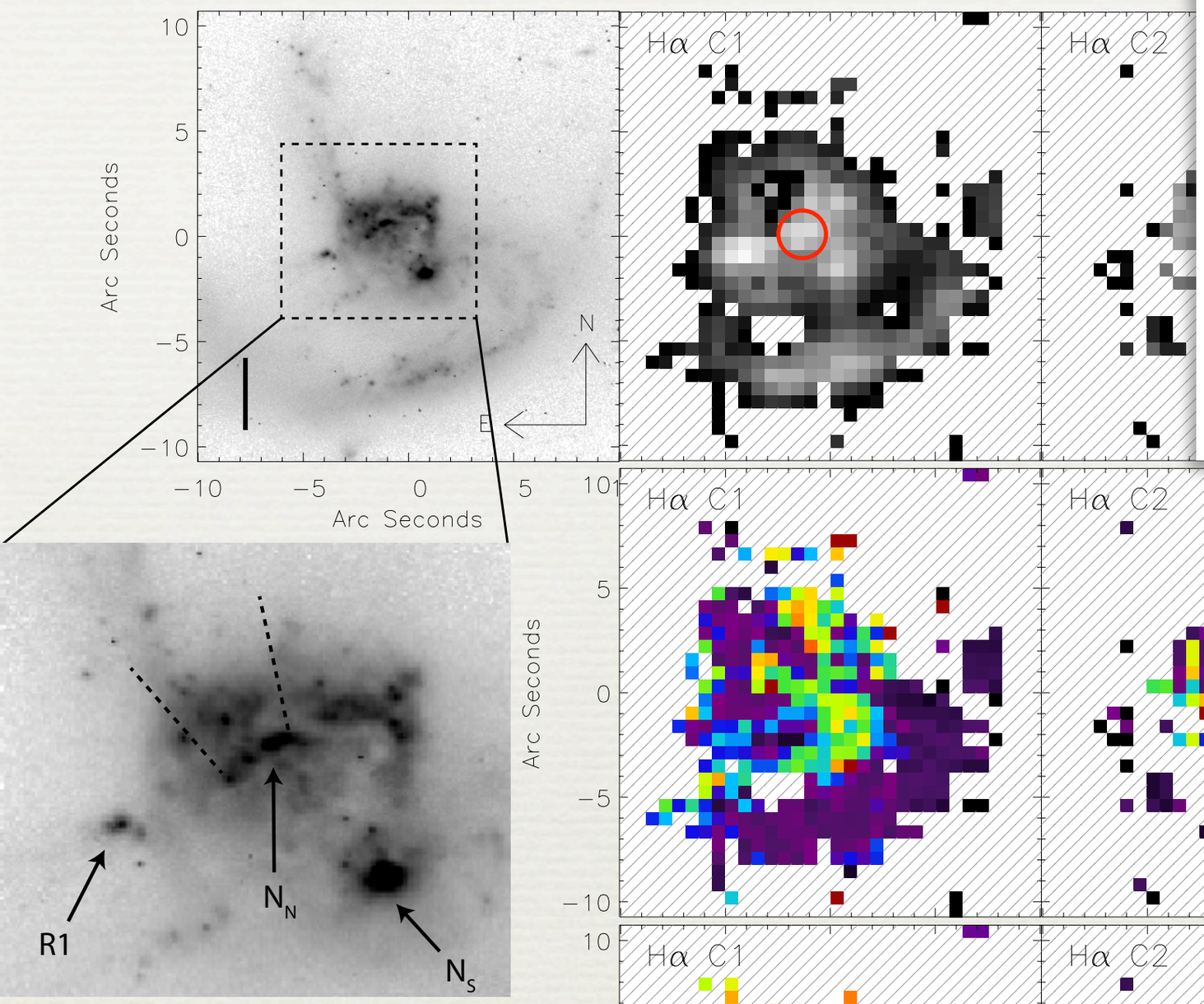

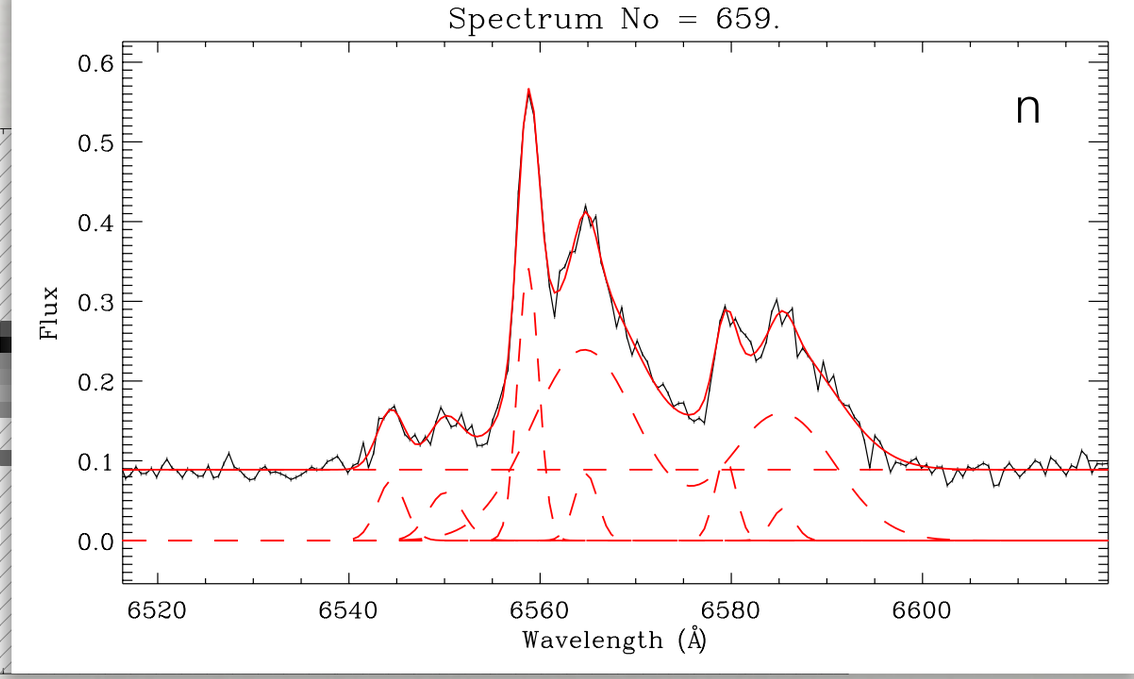

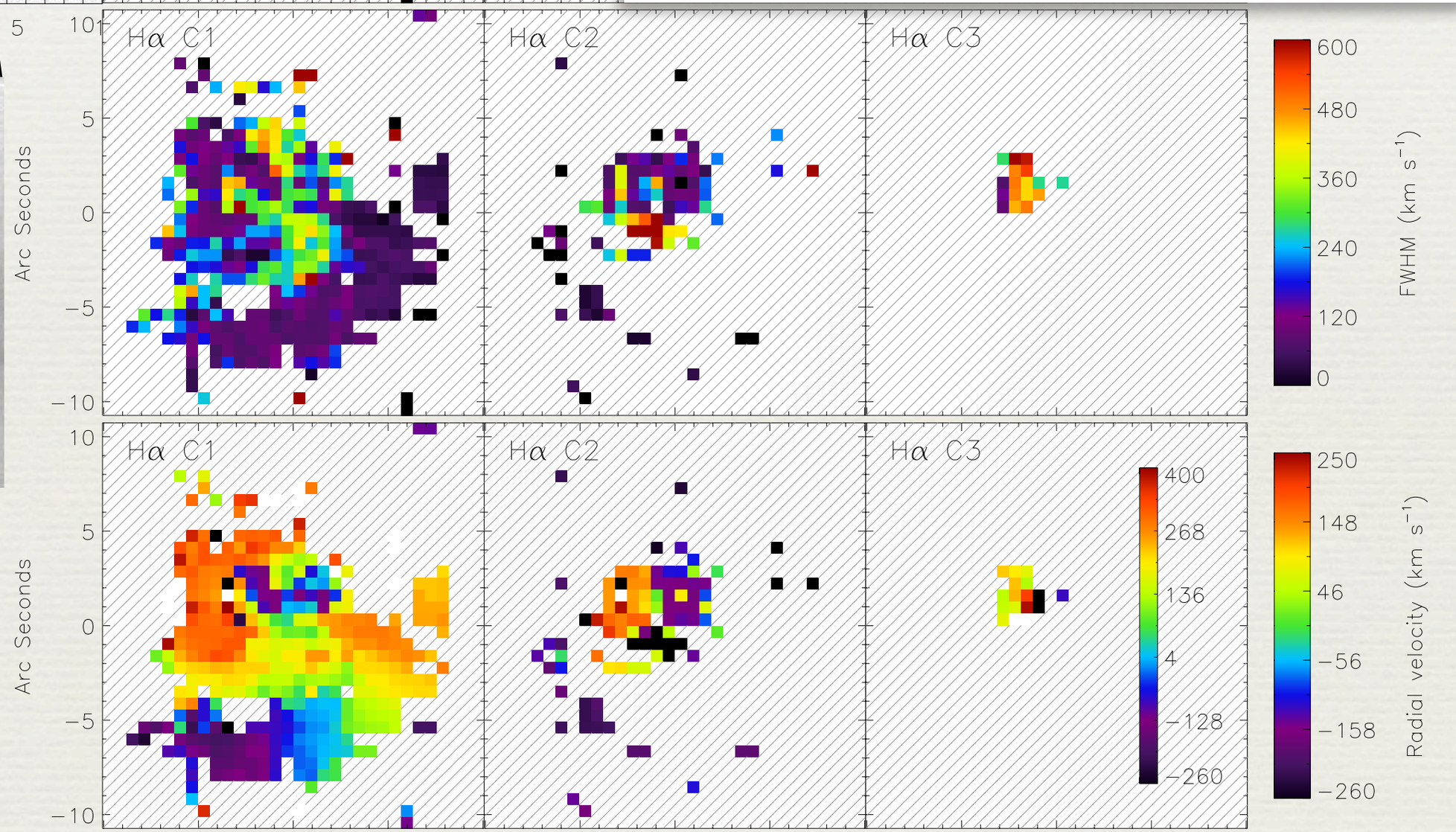

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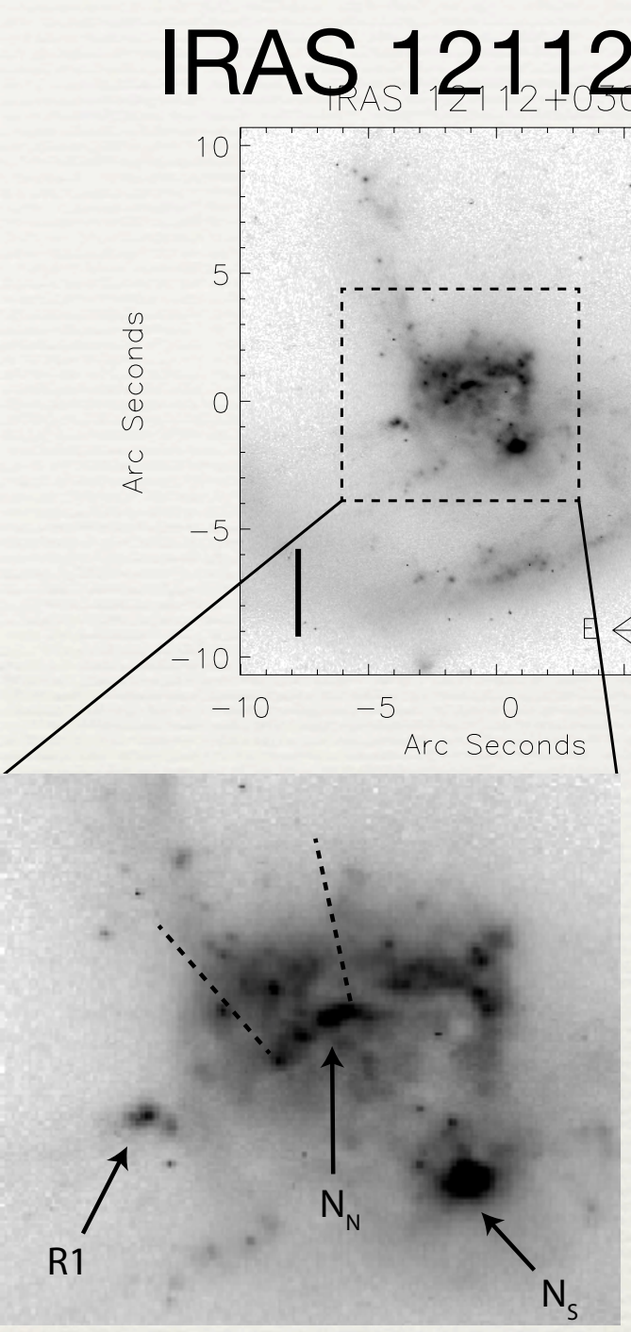
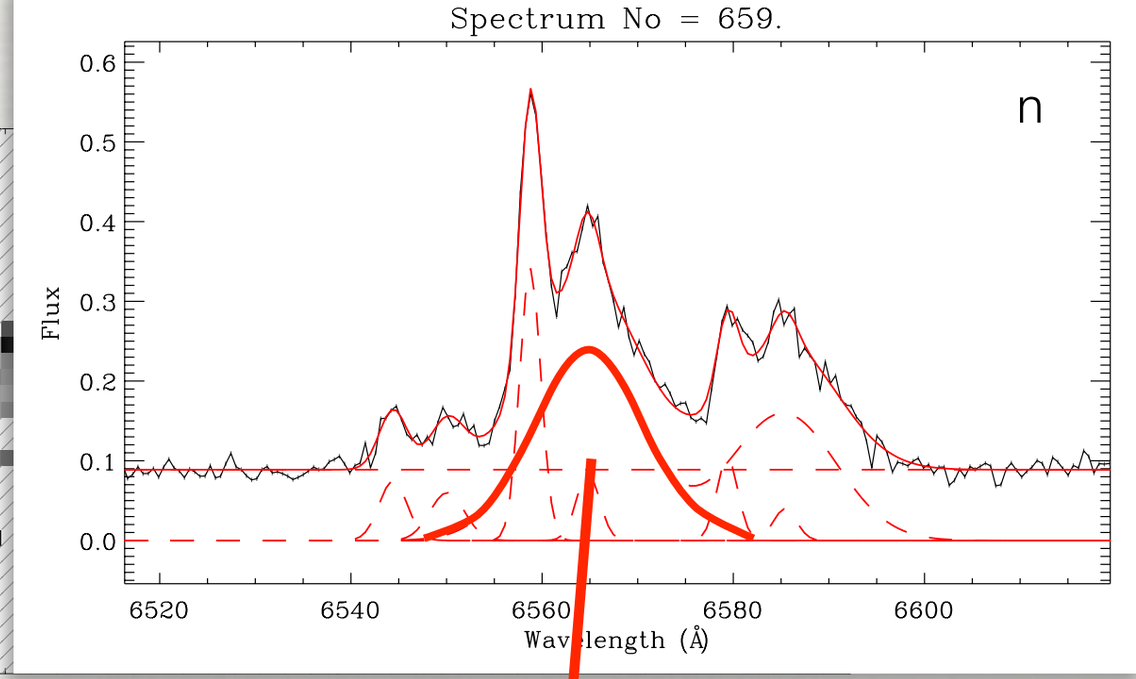
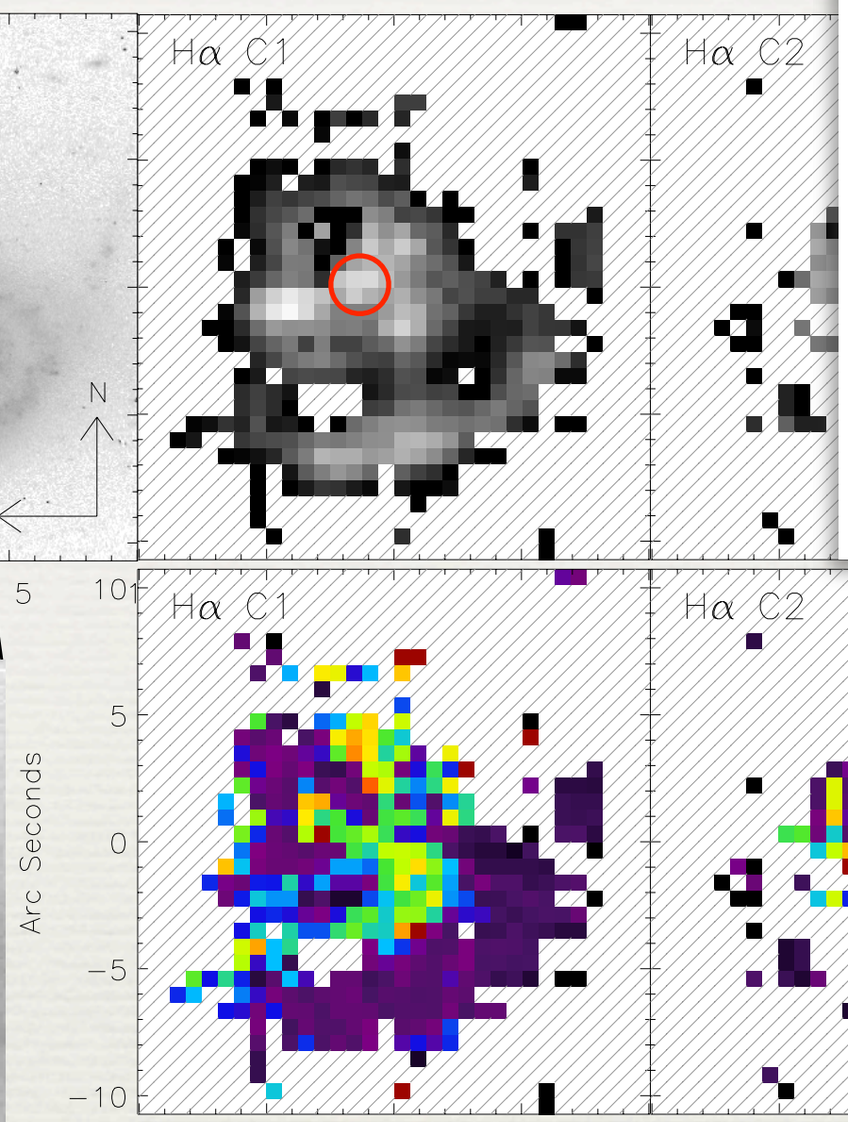
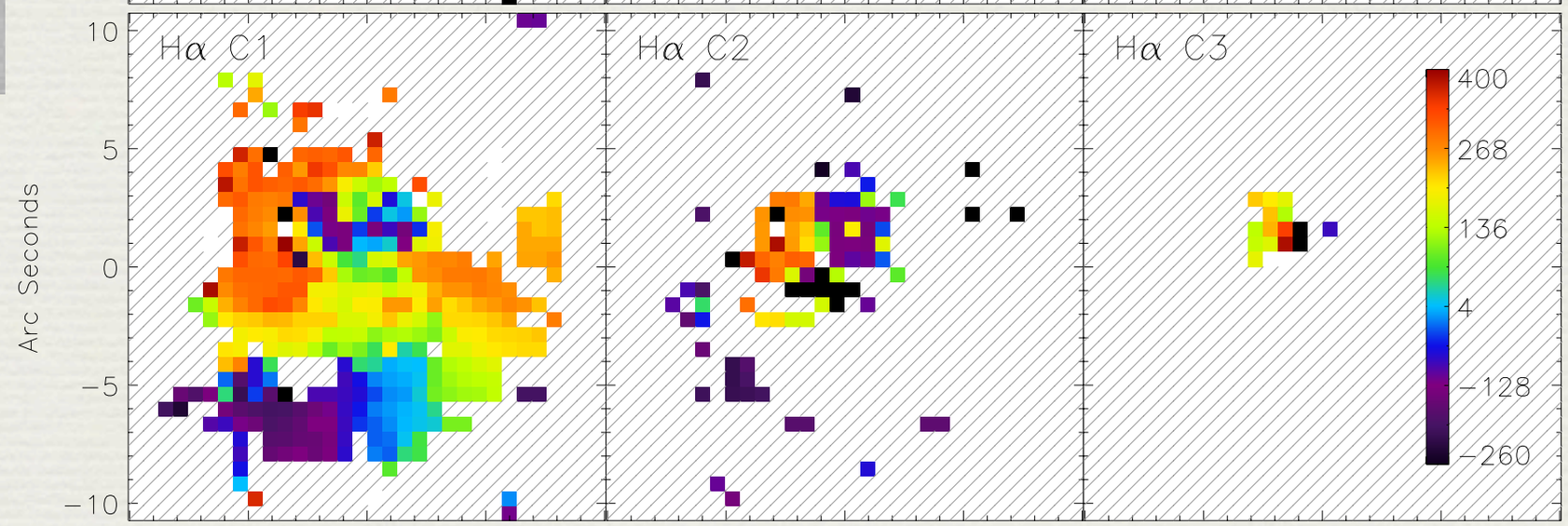
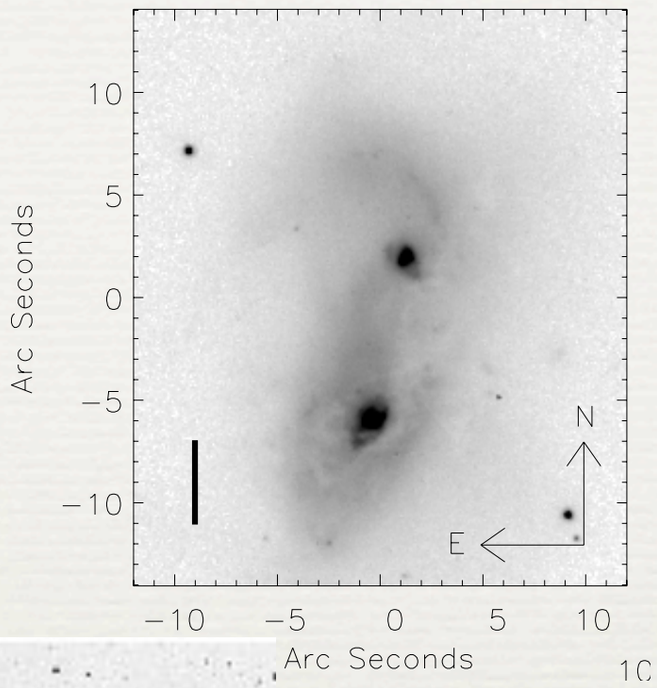


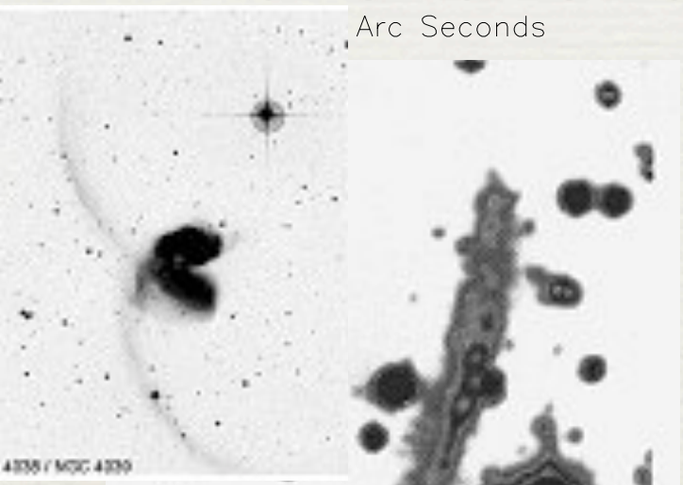


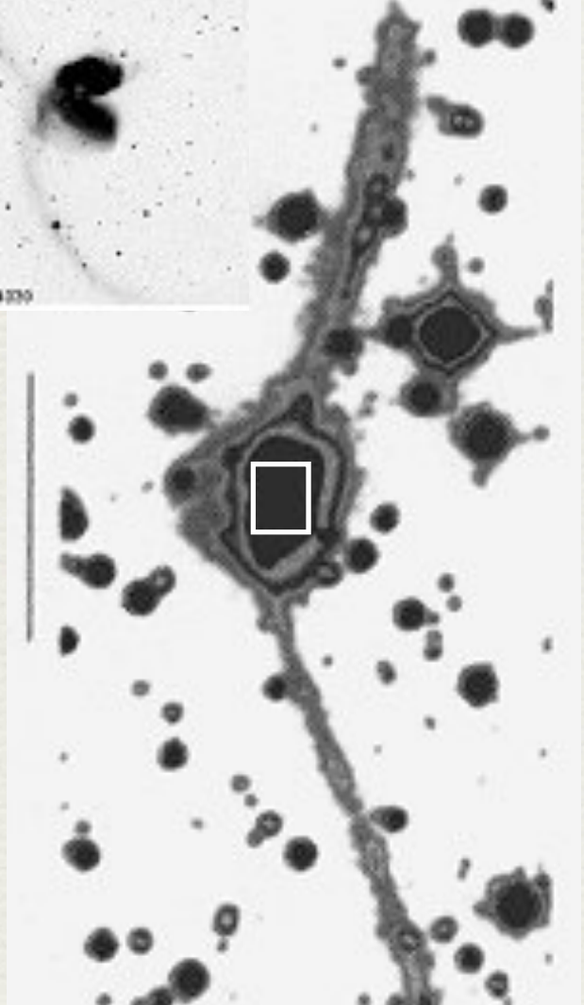




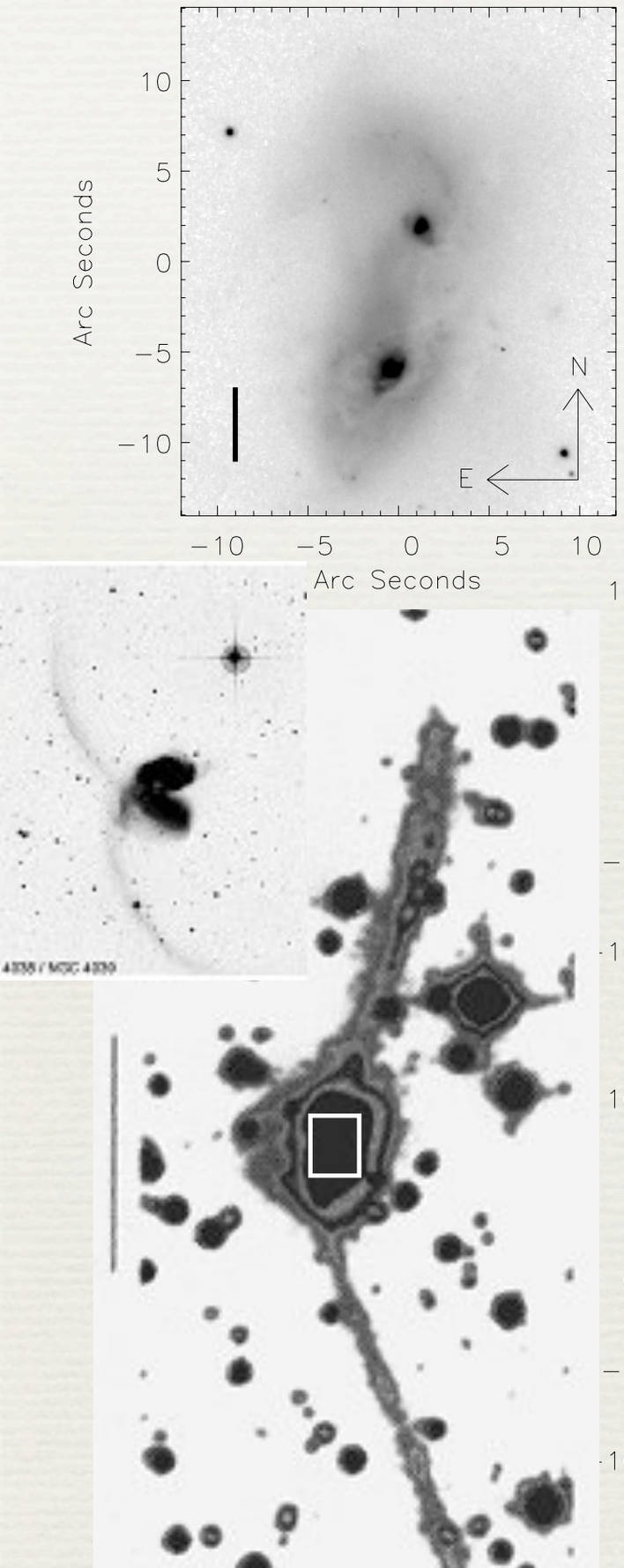
IRAS 19254-7245: the superantennae

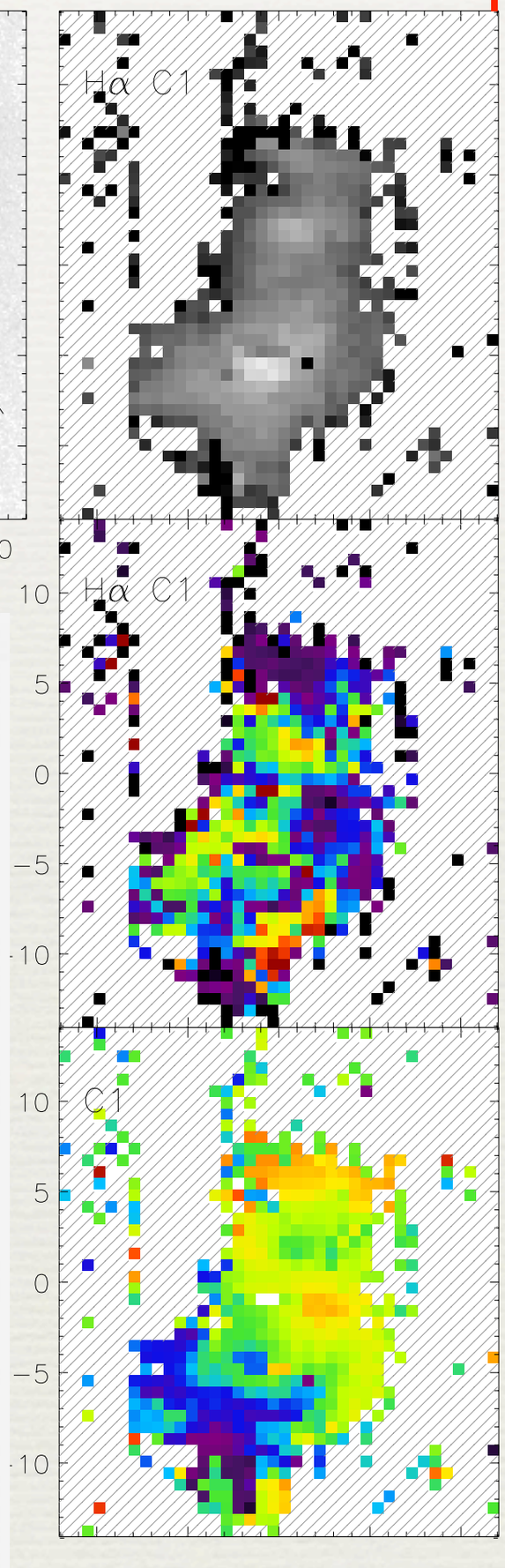


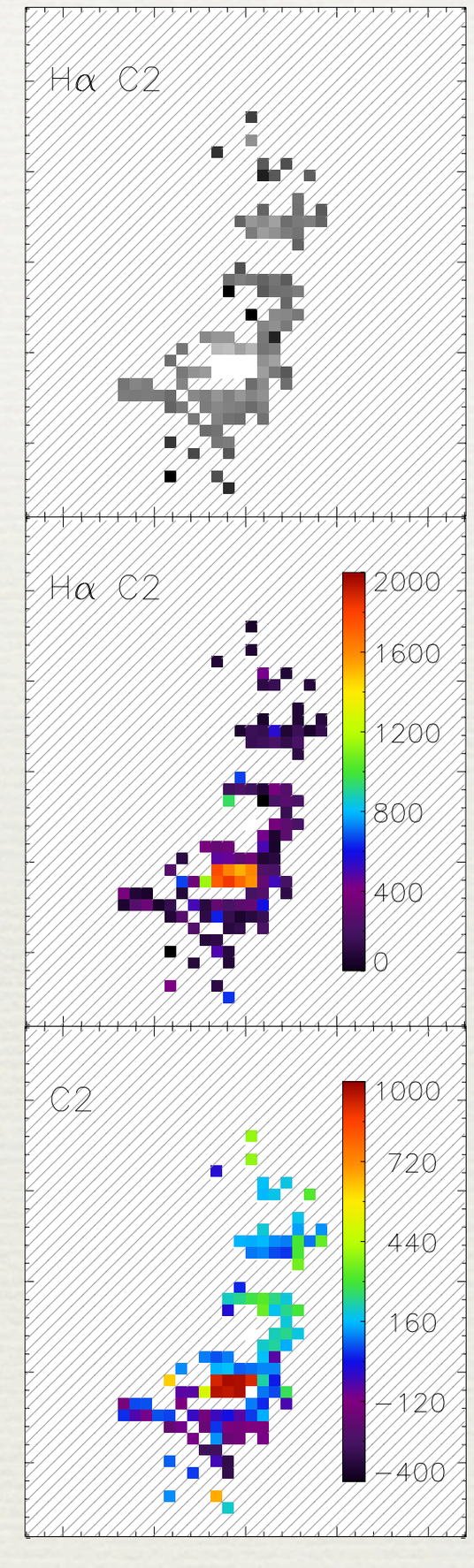


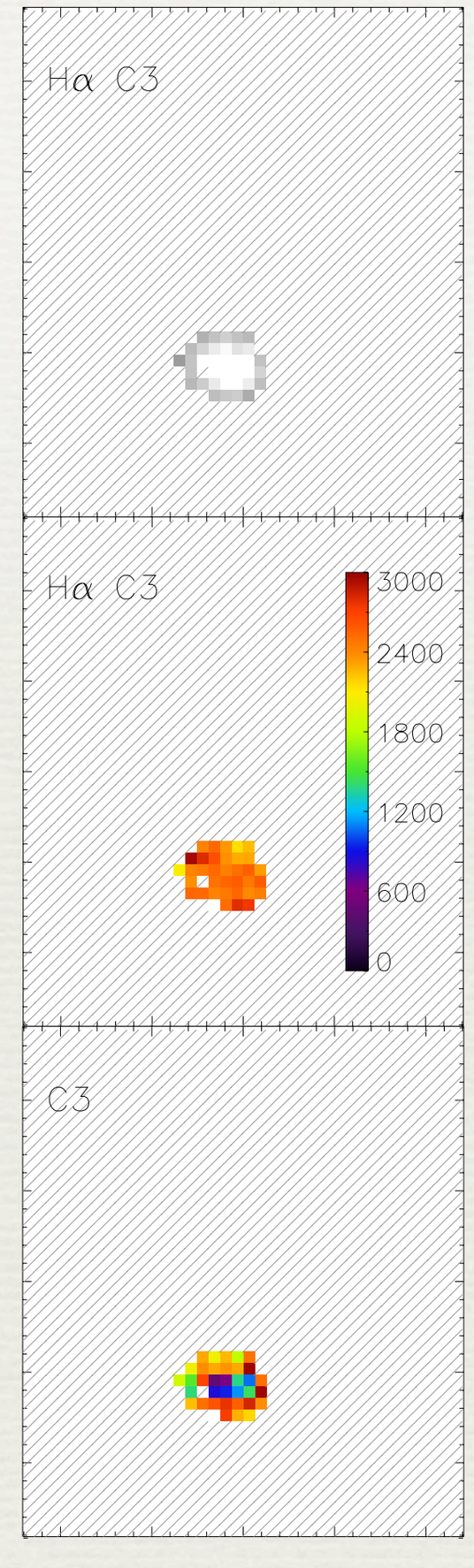


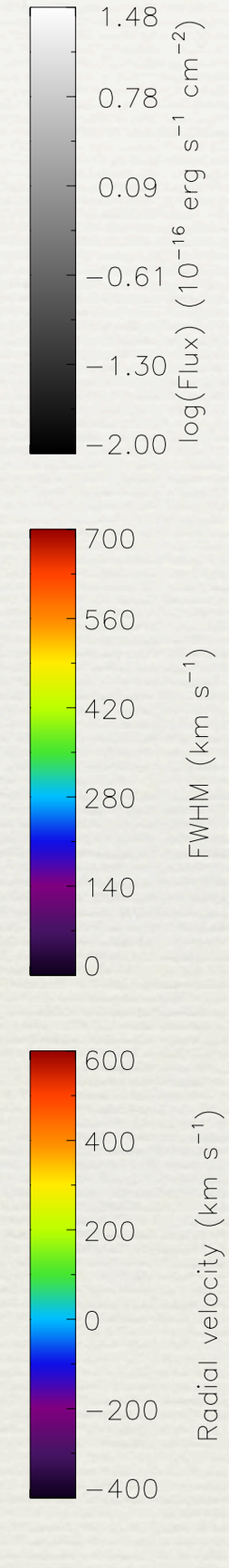
IRAS 19254-7245: the superantennae



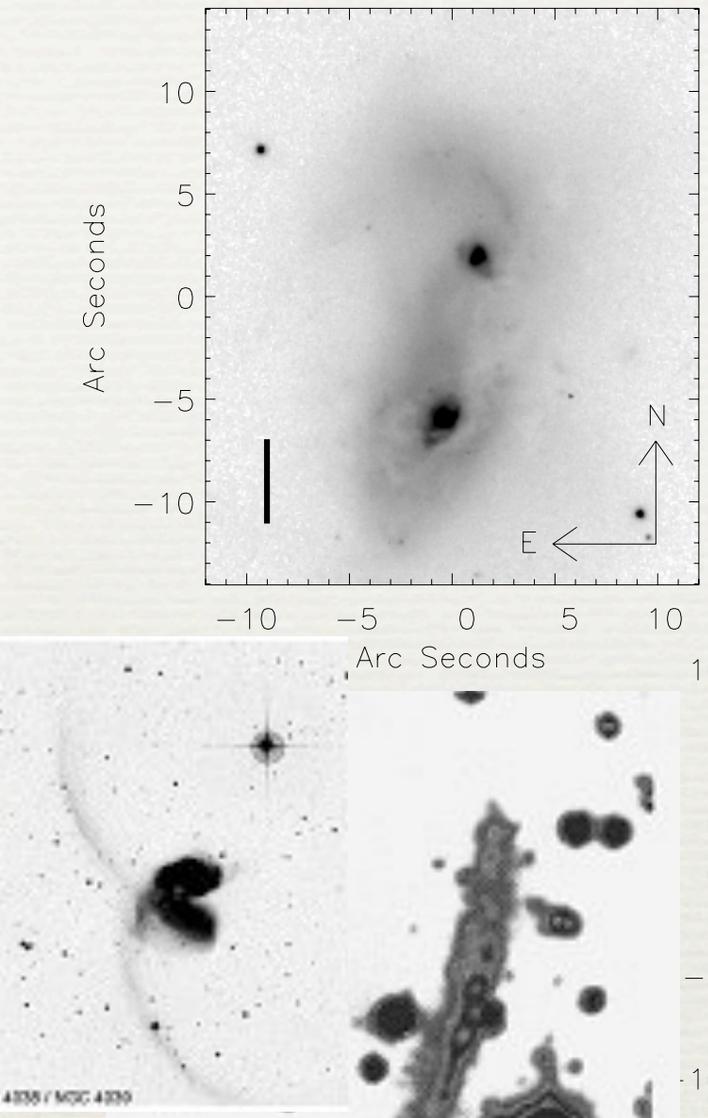


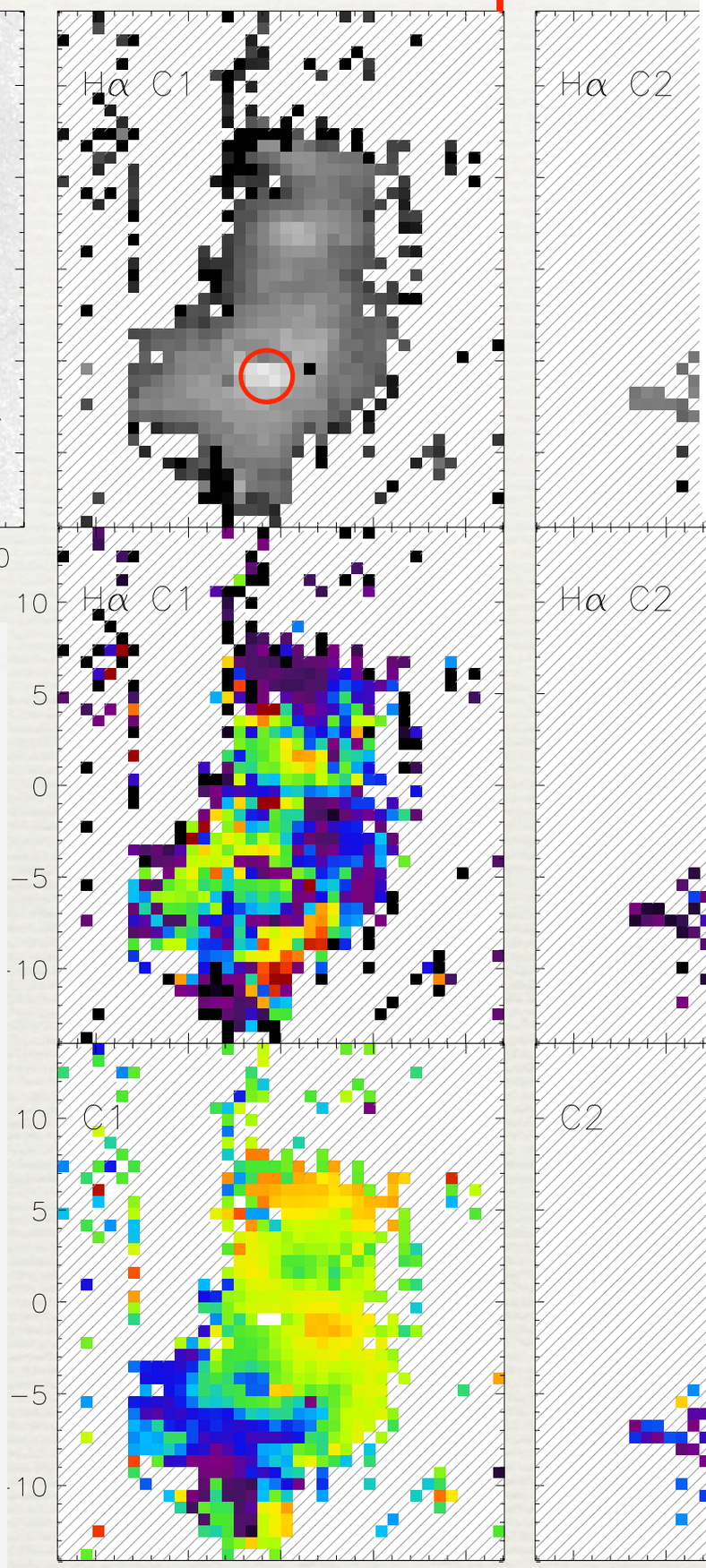


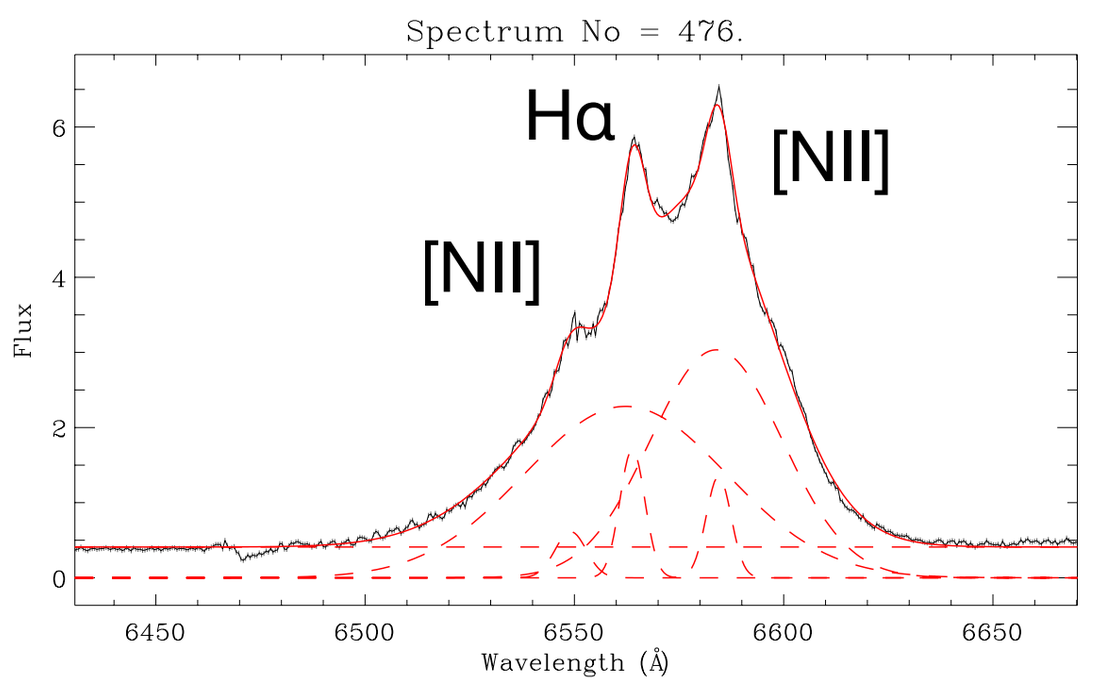




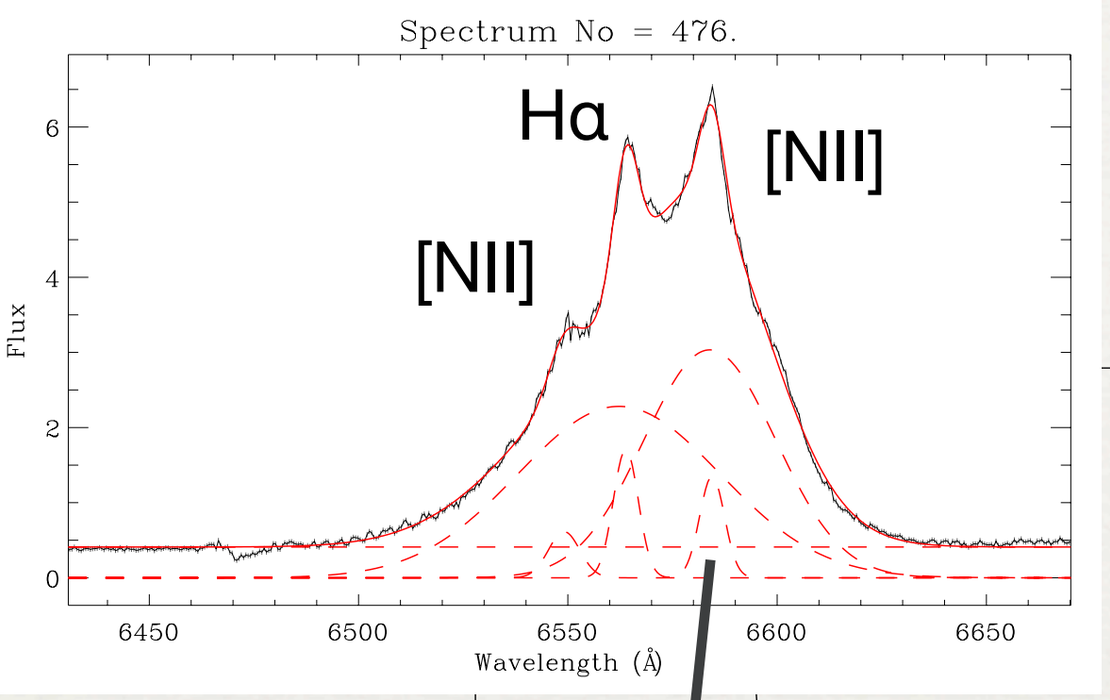
IRAS 19254-7245: the superan

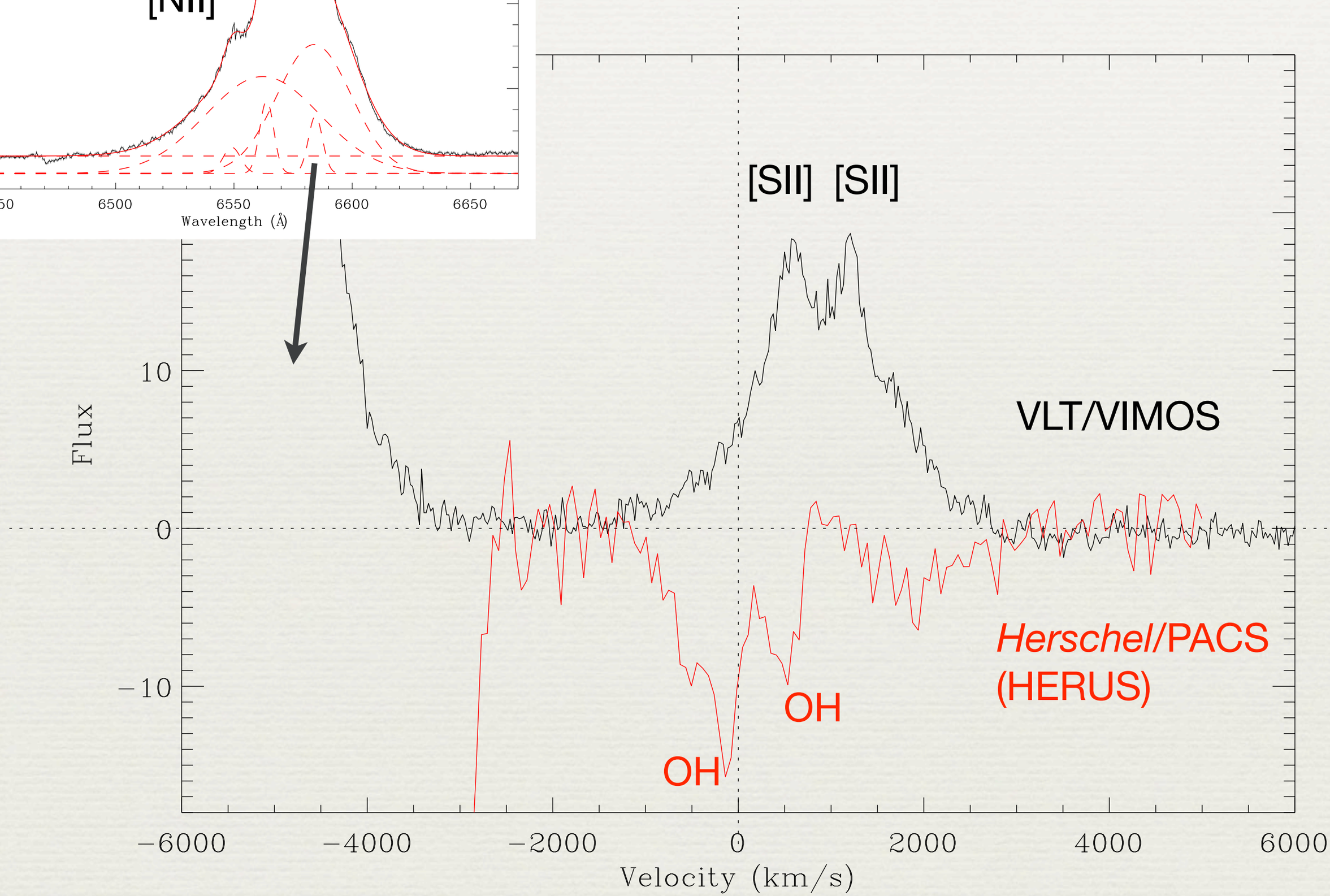






IRAS 19254-7245 N_S





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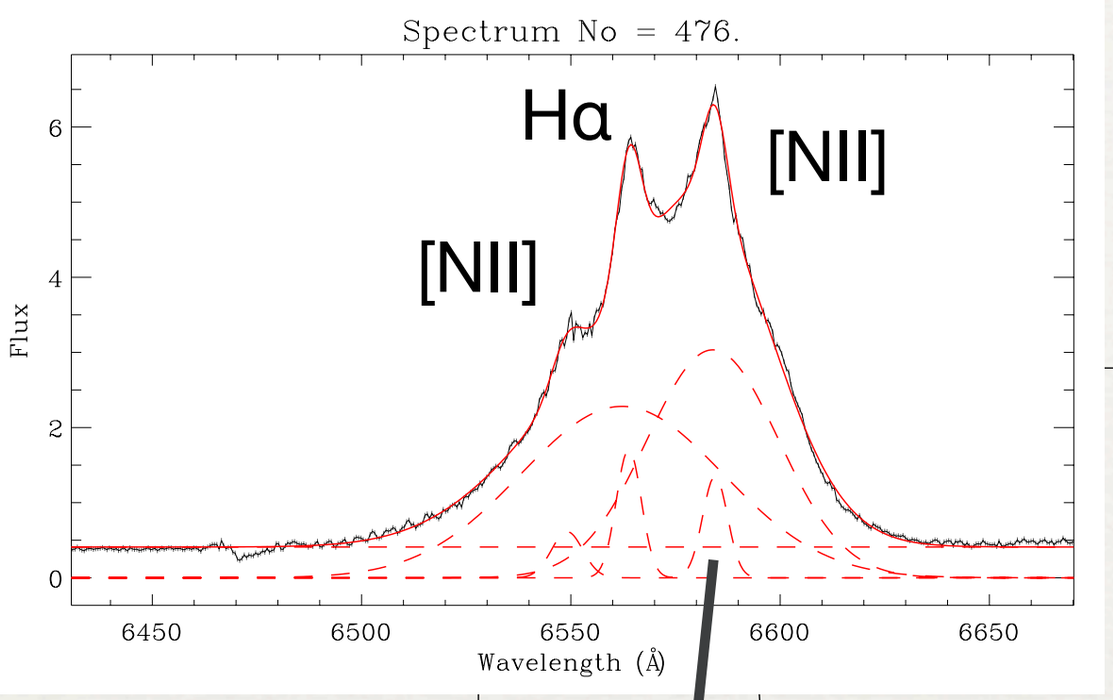
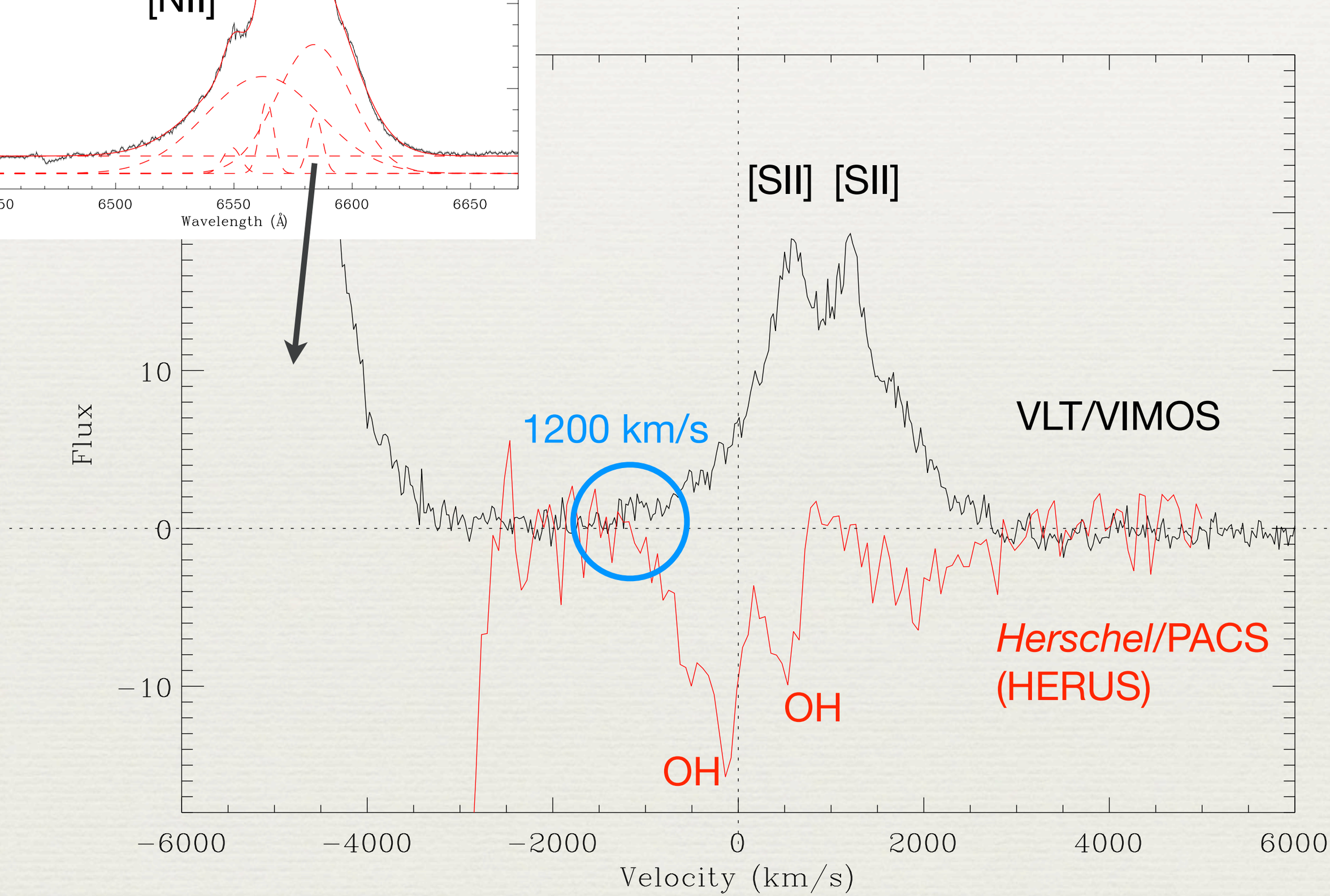
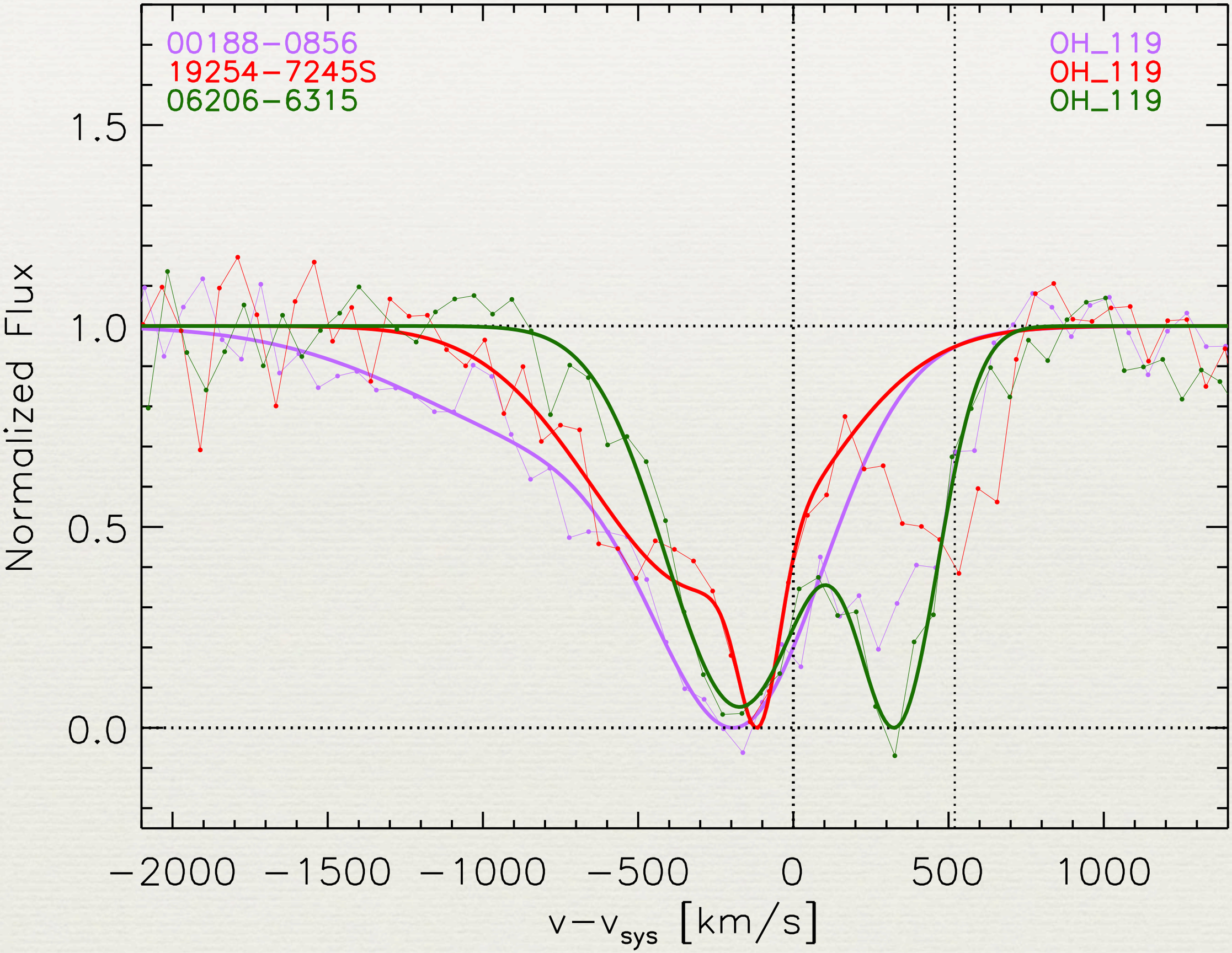
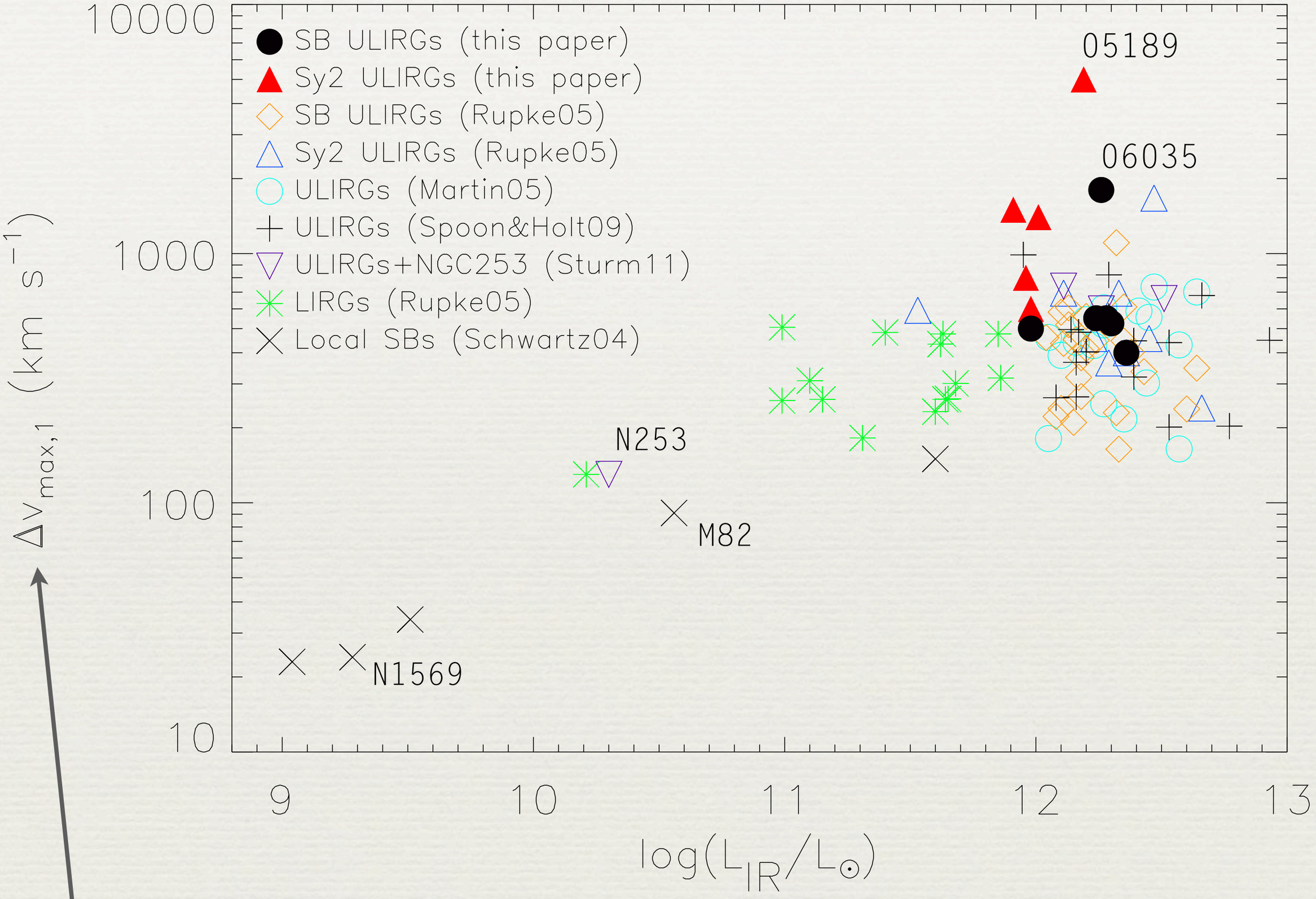




Herschel/PACS OH 119μm lines





$$\Delta v_{\mathrm{max},1} = \left|\langle v\rangle_{\mathrm{broad}} - \Delta v_{\mathrm{broad(FWHM)}}/2\right|$$

SB ULIRGs (this paper)
Sy2 ULIRGs (this paper)
SB ULIRGs (Rupke05)
Sy2 ULIRGs (Rupke05)
ULIRGs (Martin05)
ULIRGs (Spoon&Holt09)
ULIRGs+NGC253 (Sturm11)
LIRGs (Rupke05)
Local SBs (Schwartz04)

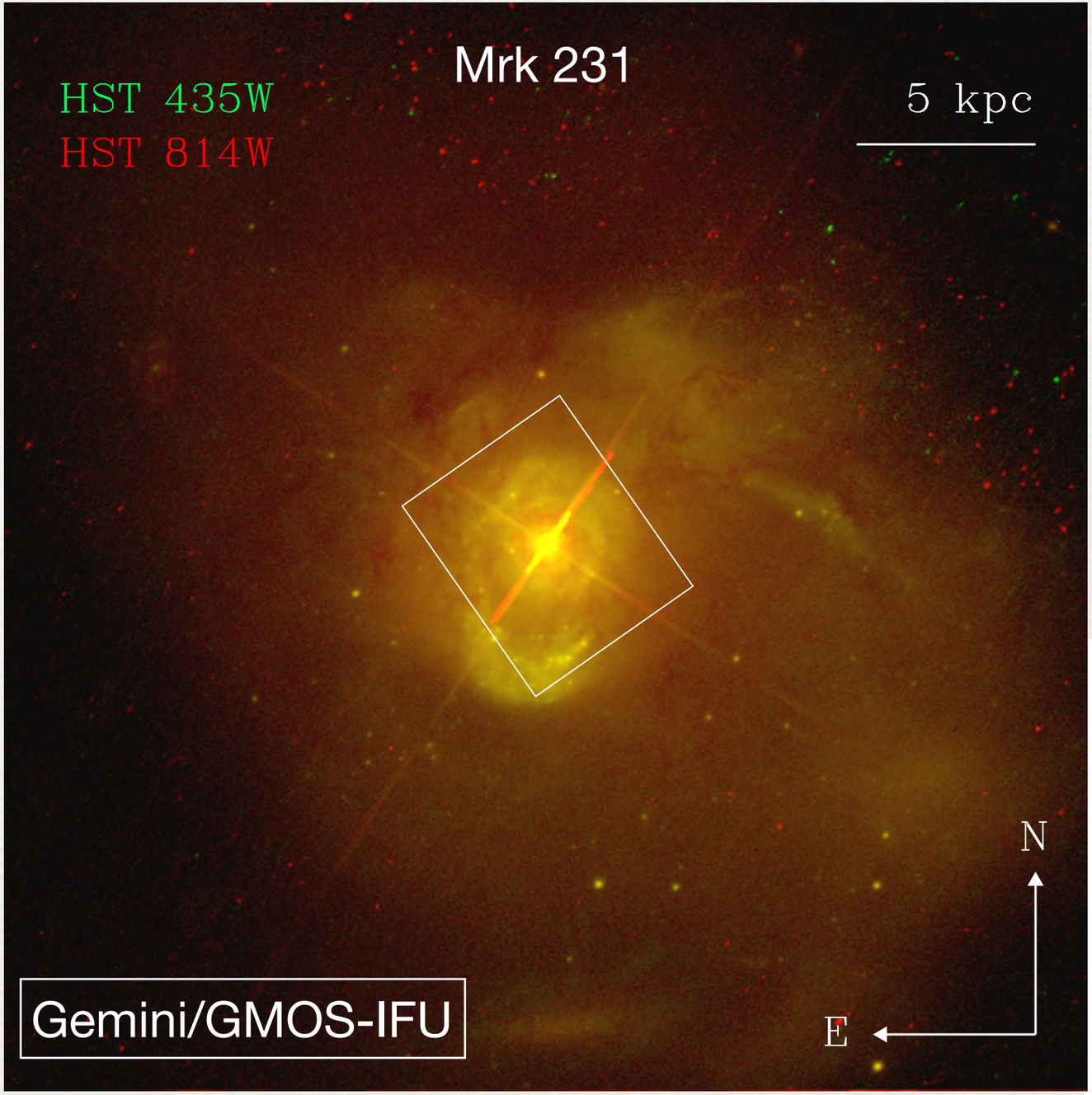
05189
06035
N253
M82
N1569

- Molecular
- Neutral
- Ionized

$\Delta v_{max,1}$ (km s^{-1})

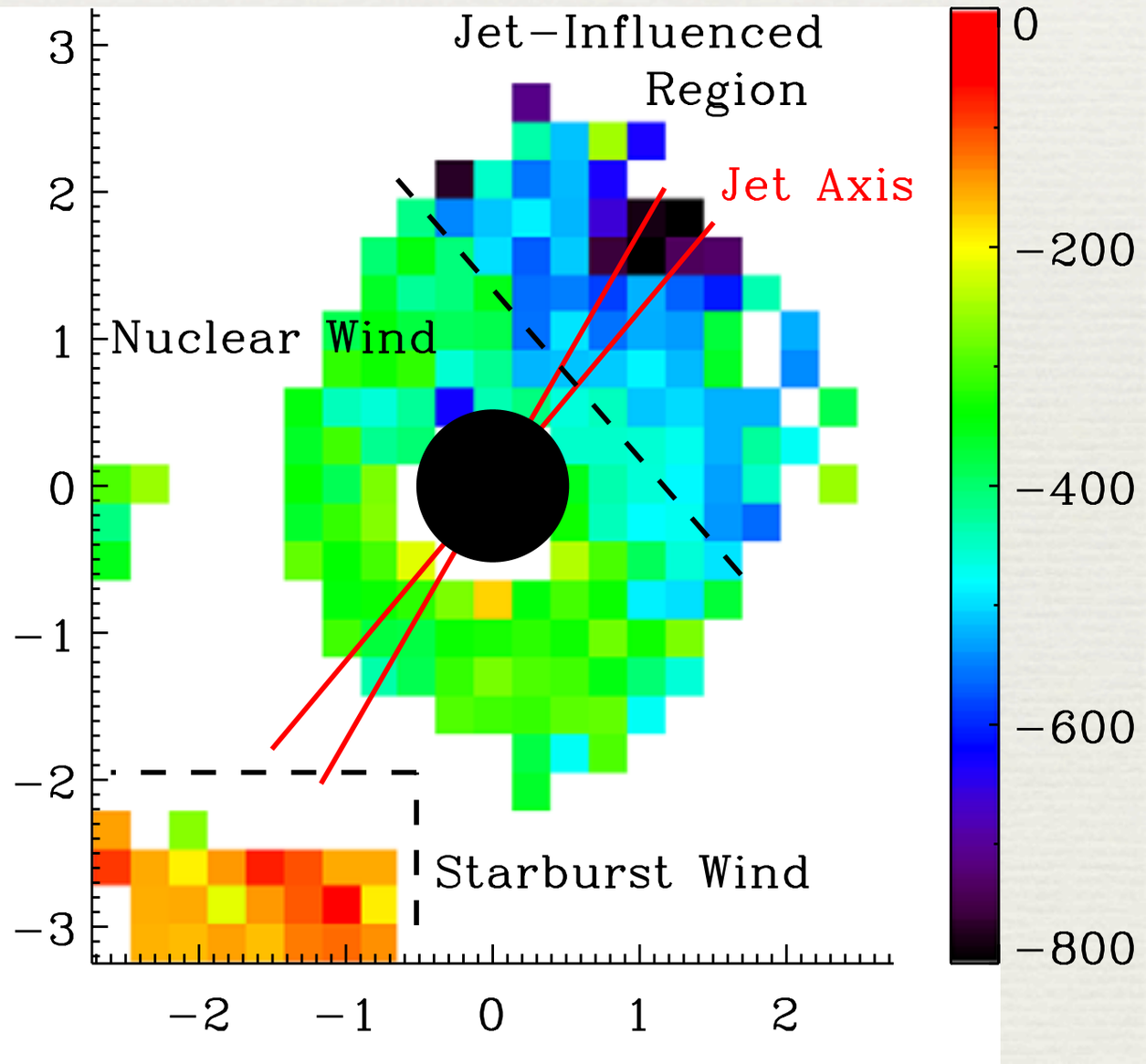
$\log(L_{IR}/L_\odot)$

$$\Delta v_{\mathrm{max},1} = \left|\langle v\rangle_{\mathrm{broad}} - \Delta v_{\mathrm{broad(FWHM)}}/2\right|$$



Rupke & Veilleux 2011

Neutral Gas $v_{50\%}$



Thanks