SFN 300 #41-50

2018/1/19

東大天文センター　森智宏

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42. XMM-Newton imaging of V 1818 Ori: a young group on the eastern edge of κ Ori ring
43. Orbital Solution for the Spectroscopic Binary in the GW Ori Hierarchical Triple
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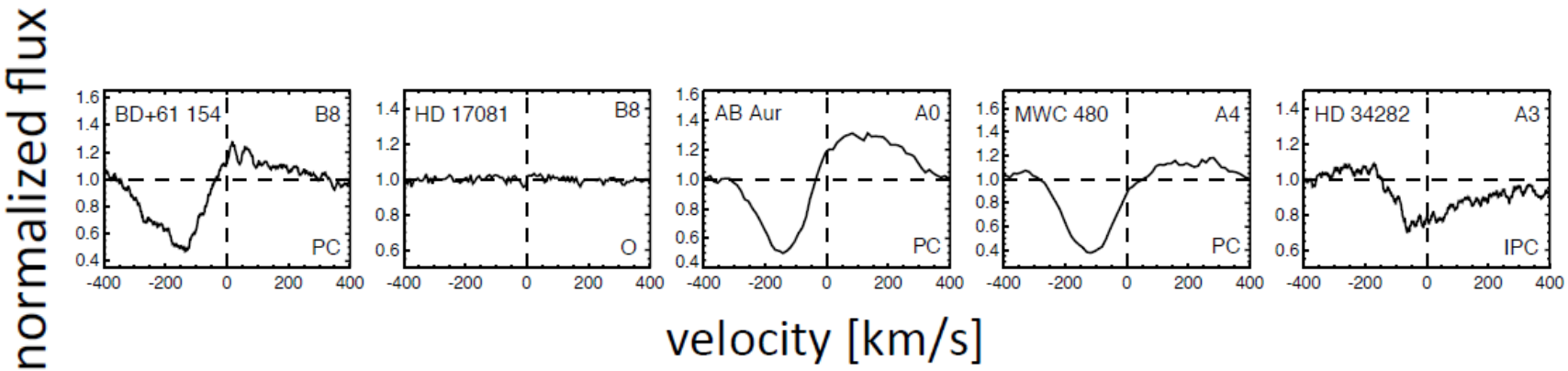
LINKING SIGNATURES OF ACCRETION WITH MAGNETIC FIELD MEASUREMENTS – LINE PROFILES ARE NOT SIGNIFICANTLY DIFFERENT IN MAGNETIC AND NON-MAGNETIC HERBIG AE/BE STARS

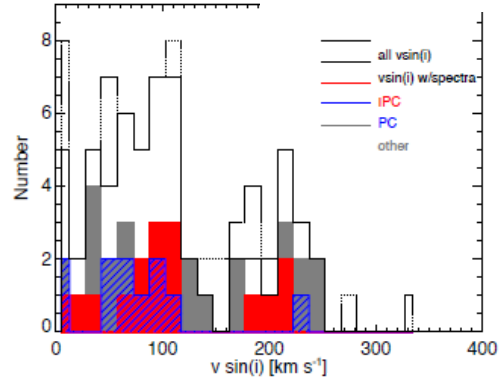
Megan Reiter,[1] Nuria Calvet,[1] Thanawuth Thanathibodee,[1] Stefan Kraus,[2] P. Wilson Cauley,[3] John Monnier,[1] Adam Rubinstein,[1] Alicia Aarnio,[4] and Tim J. Harries[2]

- CTTSで考えられている磁気圏降着モデルがHAeBe型星でも成立するか？
- 64個のHAeBe型星についてHeI 10830 A profileを調べた
- 星の自転周期・質量・降着率・傾斜角との相関を議論

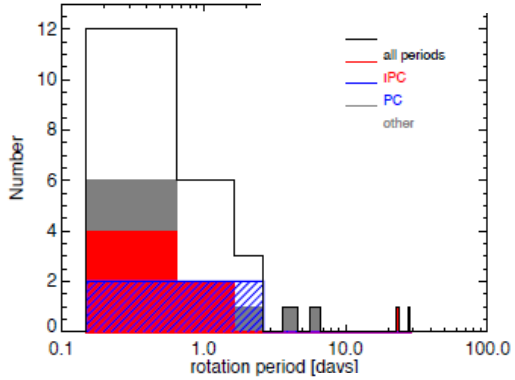


- Folded-port InfraRed Echellette (FIRE) spectrograph (Baade/Magellan)で観測
- profileの形状についてP Cygni (PC), inversed P Cygni (IPC), その他 (O)に分類
- 53 % がPC 又はIPC ⇒ 円盤降着のシグナルをとらえている
- 19/64がPC, 15/64がIPC
- 磁場を直接測定するのが難しいため、他のパラメータから間接的に相関を議論

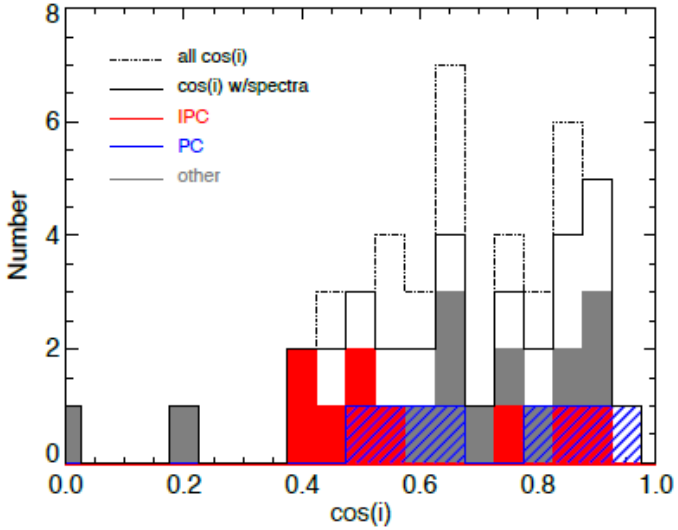
視線速度



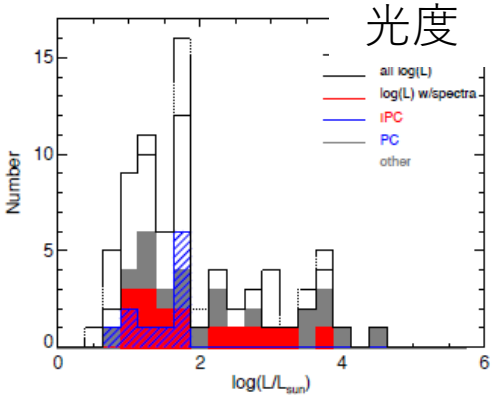
自転周期



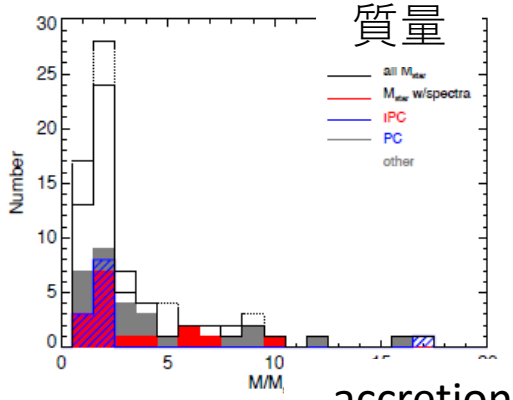
傾斜角



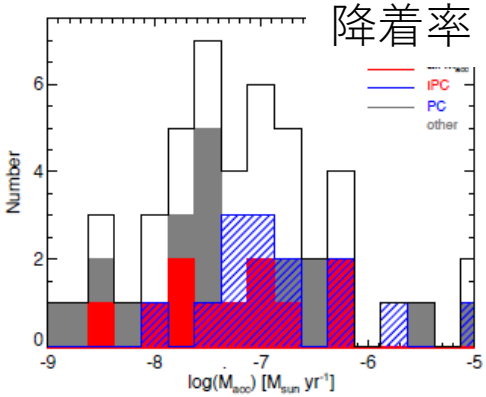
光度



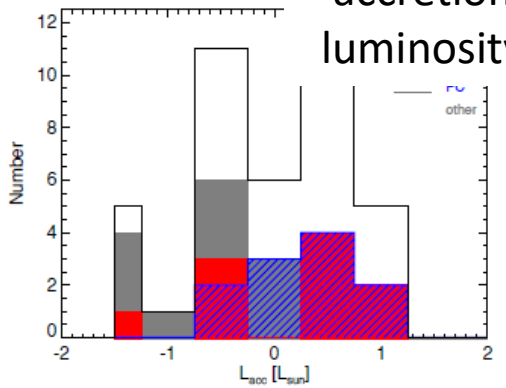
質量

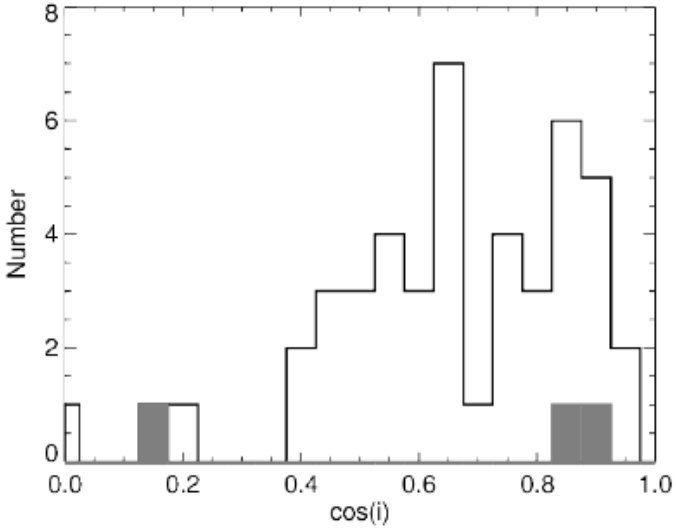


降着率



accretion luminosity





Line-dependent veiling in very active classical T Tauri stars

A.C.S. Rei[1,2], P. P. Petrov[3], and J.F. Gameiro[1,2]

- veiling : 降着によるphotospheric 輝線の”埋め込み”.　降着率の指標
- **近年line強度に依存したveilingの振る舞いが報告**
- LkHα 321, V1331 Cyg and AS 353 Aについて可視域で高分散分光を行った

Table 1: Stellar parameters

Star	Sp.Type	$T_{\rm eff}$ (K)	log L_* ($L_\odot$)	M_*^d ($M_\odot$)	R_*^d ($R_\odot$)	log g^d (dex)	v sin i (km s^{-1})	v_{rad} (HIRES) (km s^{-1})	EW(Hα) (Å)	EW(HeI) (Å)
LkHα 321	G5-G7	5500-5250	1.42^a	2.9	5.3	3.5	32	-16.0±0.5	30	0.08
V1331 Cyg	G7-K1	5250-5000	1.32^b	2.9	5.5	3.5	<6	-15.0±0.3	53	0.22
AS 353A	K0-K1	5100-4900	0.4^c	1.6	2.1	4.0	<6	-10.4±0.2	58	1.30

Notes. Sp.type, $T_{\rm eff}$, v sin i, v_{rad}, EW(Hα), and EW(HeI) are from this paper. [a] Cohen & Kuhi (1979), [b] Tokunaga et al. (2004), [c] Hamann & Persson (1992), [d] Obtained from $T_{\rm eff}$ and L_* and using the PMS models by Siess et al. (2000).

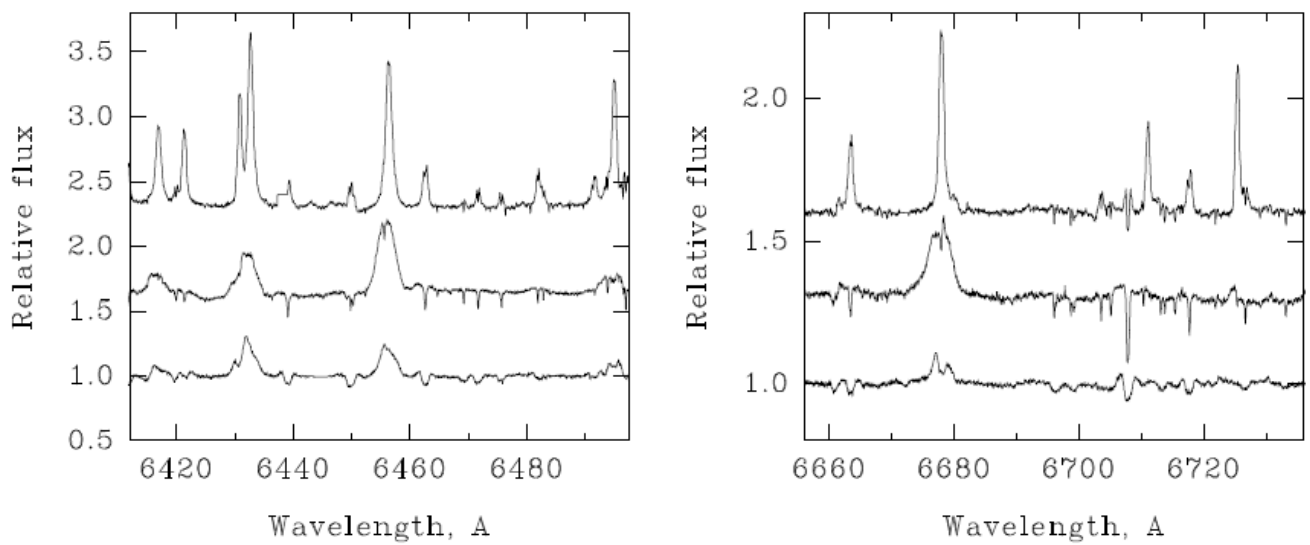


Fig. 2: Fragments of spectra: LkHα 321 (lower), AS 353A (middle), and V1331 Cyg (upper).

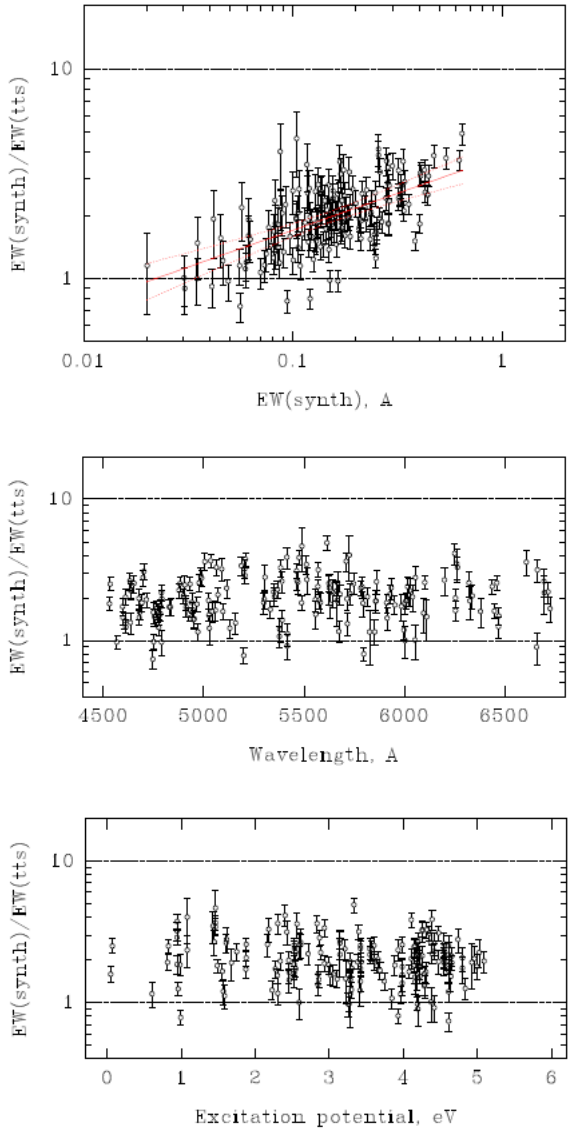


Table 4: Determination of accretion luminosities and mass accretion rates.

Star	Template	VC	$\log(L_{He}/L_{star})$ (dex)	$\log(L_{acc}/L_{star})$ (dex)	$\log(\dot{M}_{acc})$ $(M_{\odot}yr^{-1})$
LkHα 321	G8V	0.0	-4.97	-1.72	-7.4
V1331 Cyg	K0V	0.1	-4.51	-1.21	-6.9
AS 353A	K0V	0.6	-3.6	-0.31	-7.1

←LkHα 321 の結果

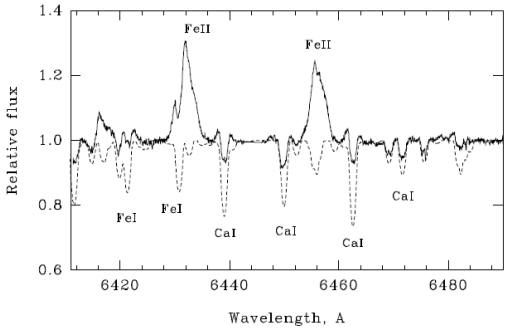
- photospheric lineの等価幅に対して依存性を検出
- 波長・励起ポテンシャルへの依存性はない

veilingの原因（ライン依存性検出を受けて）

1) hot spot (T<10000K, filling factor = 1-2 %)
2) pre-shocked gasの輝線（ライン幅広）

⇒ 広い輝線のある所でもveilingは変わらず（下）

⇒line dependent の原因ではない



3) post shock gas の輝線

⇒ accretion luminosityが小さいほど影響大

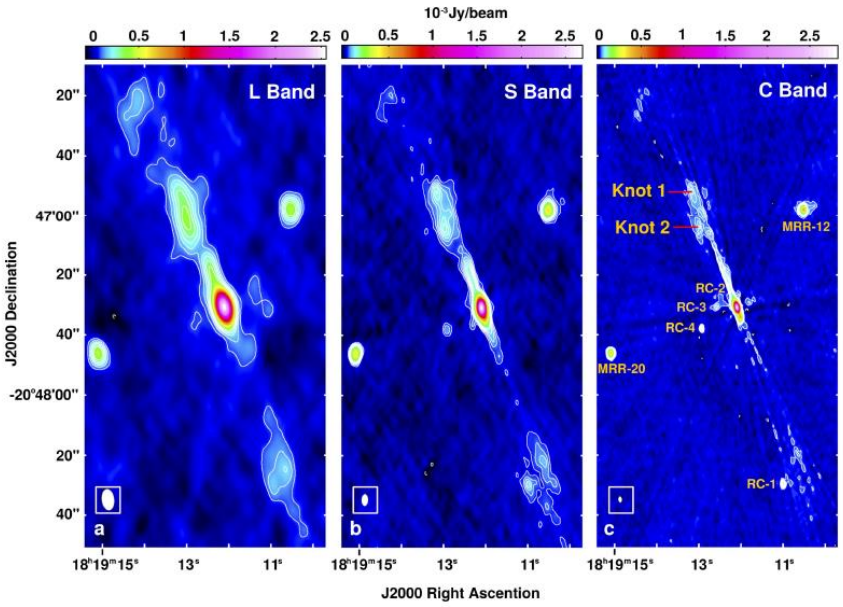
⇒ 今回の３天体の傾向と矛盾しない

➡ veilingの原因として、1) & 3)を考えるべき

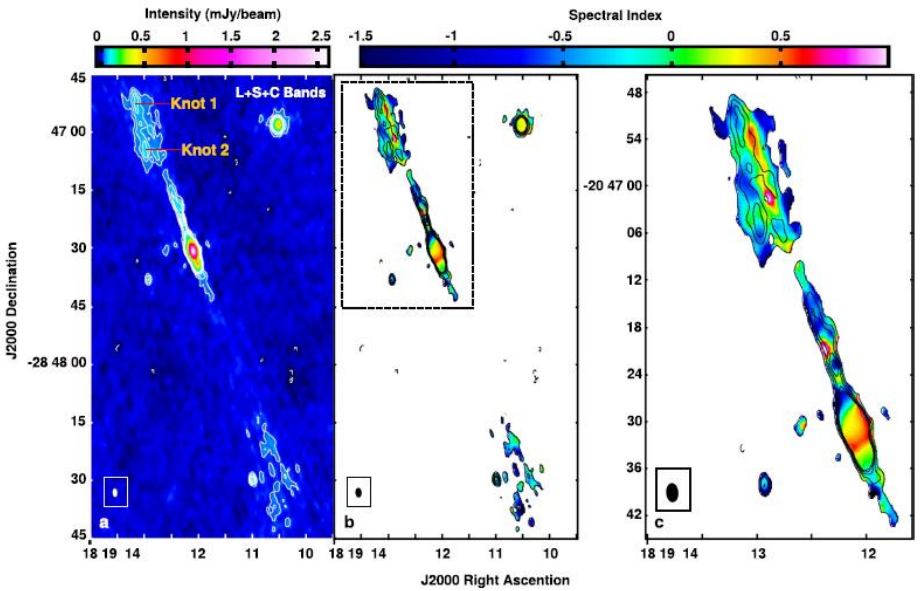
The Highly Collimated Radio Jet of HH 80–81: Structure and Nonthermal Emission

Adriana Rodríguez-Kamenetzky[1,2], Carlos Carrasco-González[2], Anabella Araudo[3], Gustavo E. Romero[4], José M. Torrelles[5,10], Luis F. Rodríguez[2], Guillem Anglada[6], Josep Martí[7], Manel Perucho[8,9], and Carlos Valotto[1]

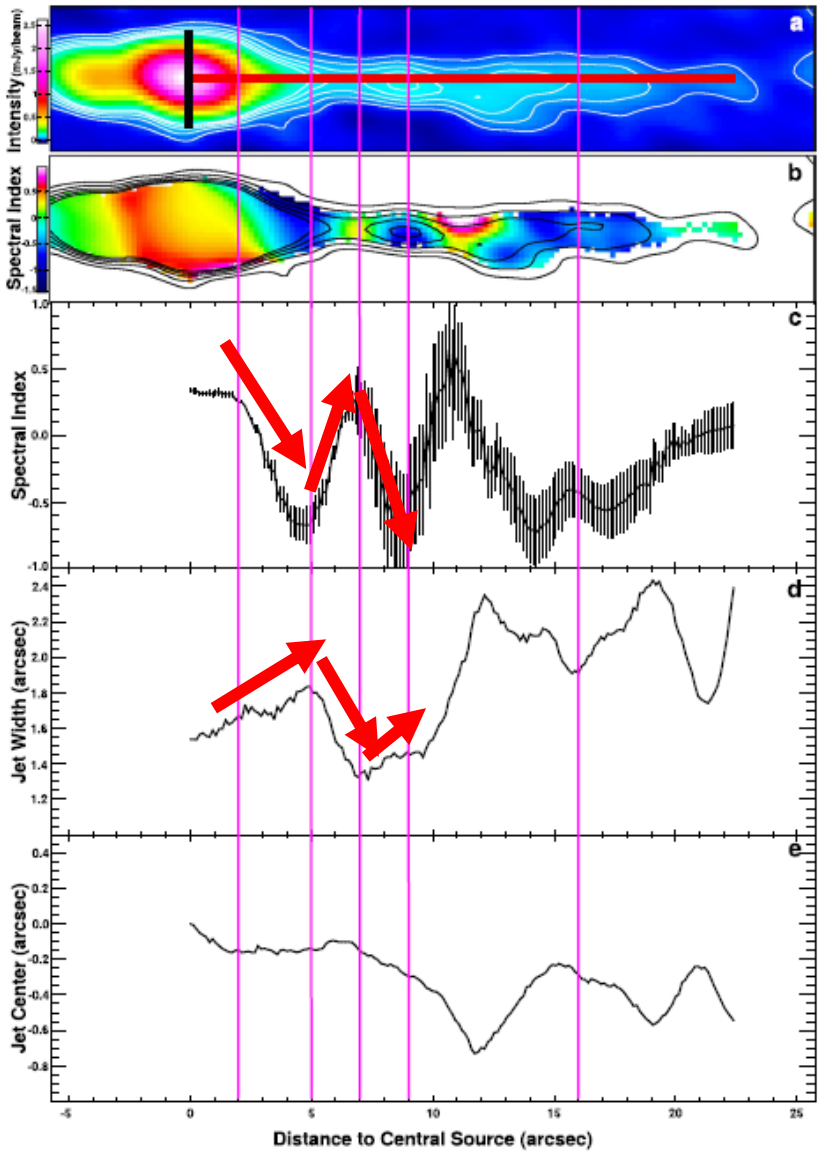
- 原始星ジェットからの放射 → thermalがほとんどだが、最近non-thermalが報告
- 代表例であるHH 80-81を3-20 cm域で観測 (Karl G. Jansky VLA (NRAO))



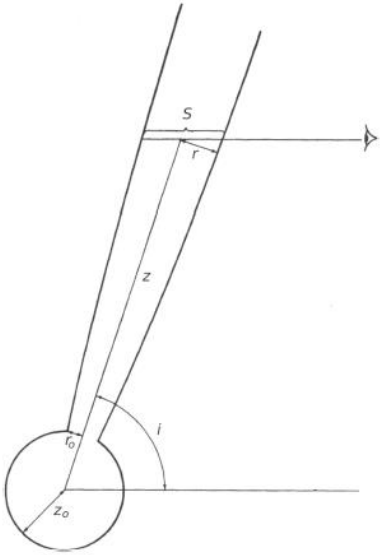
↑各波長で撮られた画像
・outflow ソースの他にknot 1, 2を検出
(周囲のガスとの相互作用？)



↑３波長合成画像 + 放射強度の波長依存性
・赤：thermal　青：non-thermal



←Jetの方向にSpectral index, ジェット幅、ジェットの方角を調べた

- Jet幅が広がるほどspectral indexは現象の傾向
- 考えられるシナリオ（下図）

1) ジェットが周囲の星間物質中で拡大し、ショックを与える
2) ジェット圧が周囲の圧力より下がるとre-collimationが起きる(reverse shock)
3) ジェットは超音速なので、元のジェットとreverse shock間の相互作用が荷電粒子の運動エネルギーに変換