

銀河中心の観点から:

Subaru でも

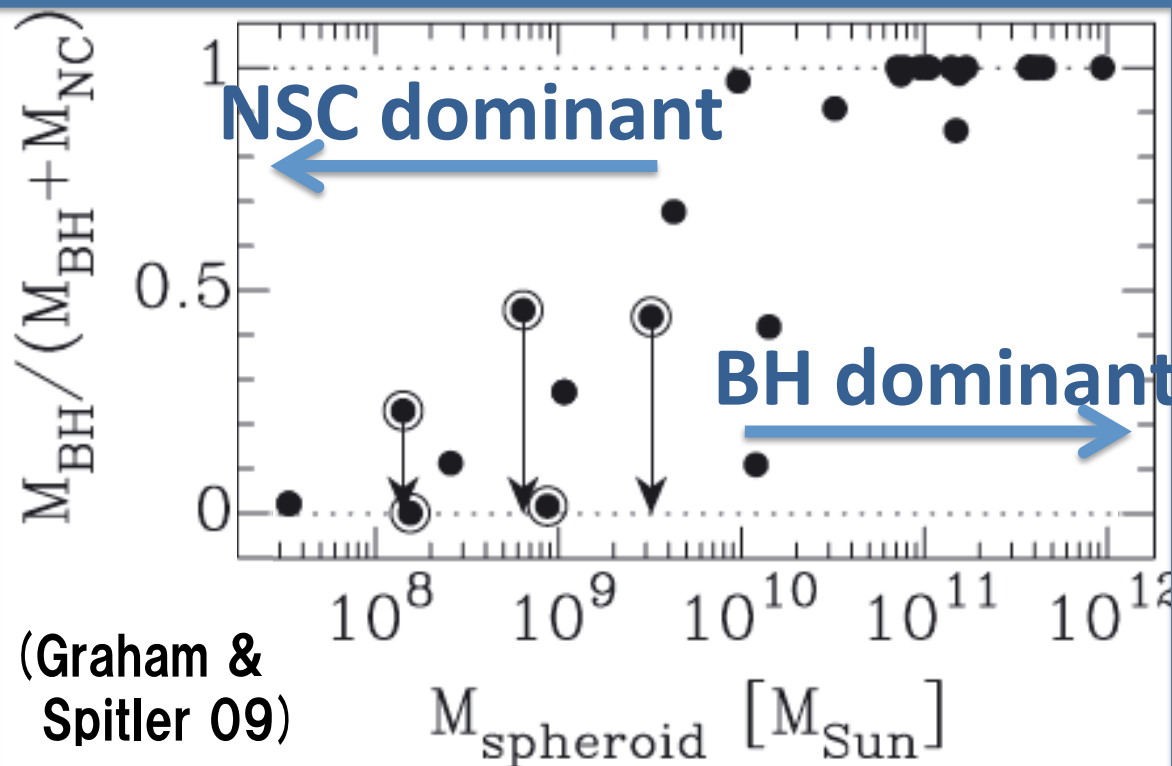
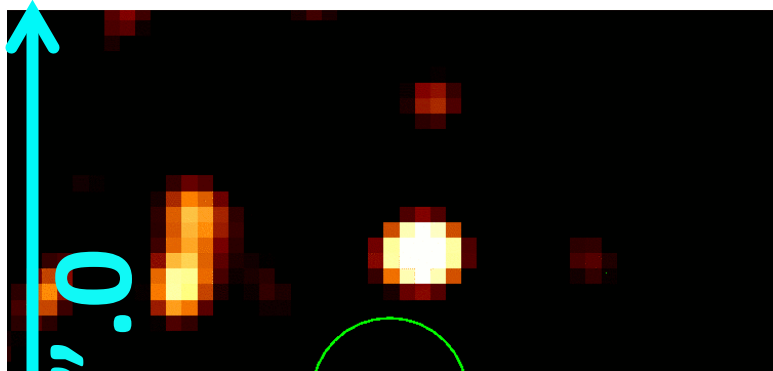
Astrometry !

西山 正吾 (国立天文台)

SMBHとその周辺

質量、降着円盤、フレア、...

VLT/ISAAC

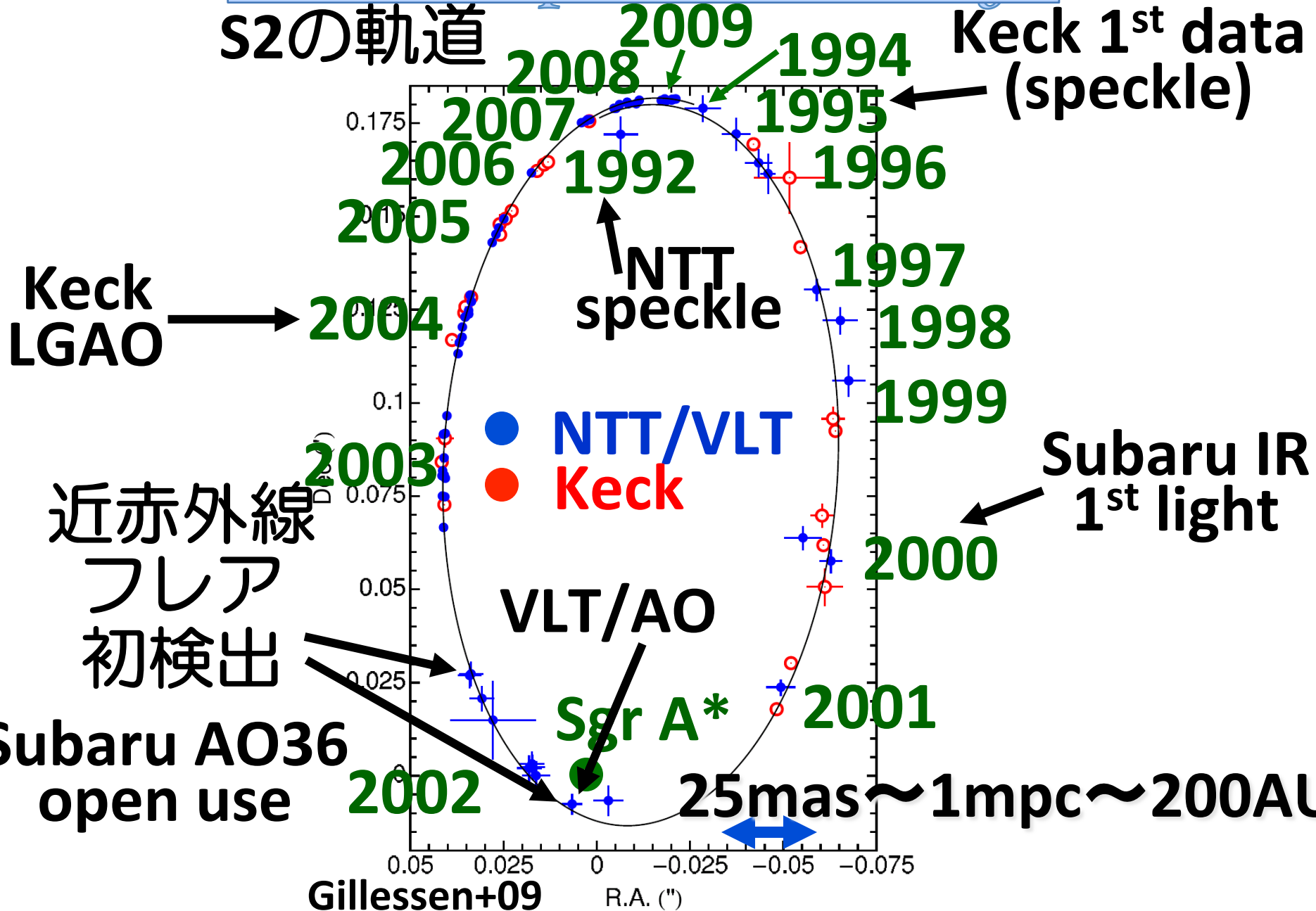


5pc ~ 2'

Nuclear Star Cluster (NSC)

Stellar Proper Motion at GC

S2の軌道



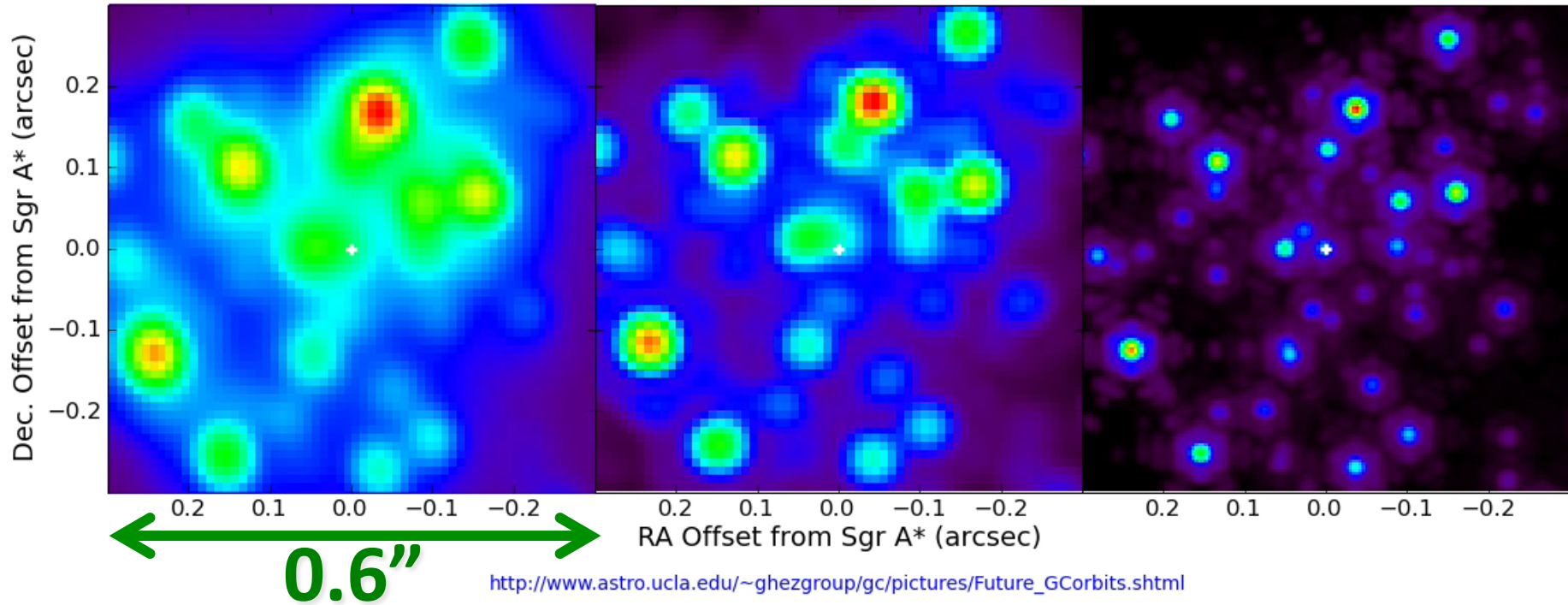
Stellar Proper Motion at GC

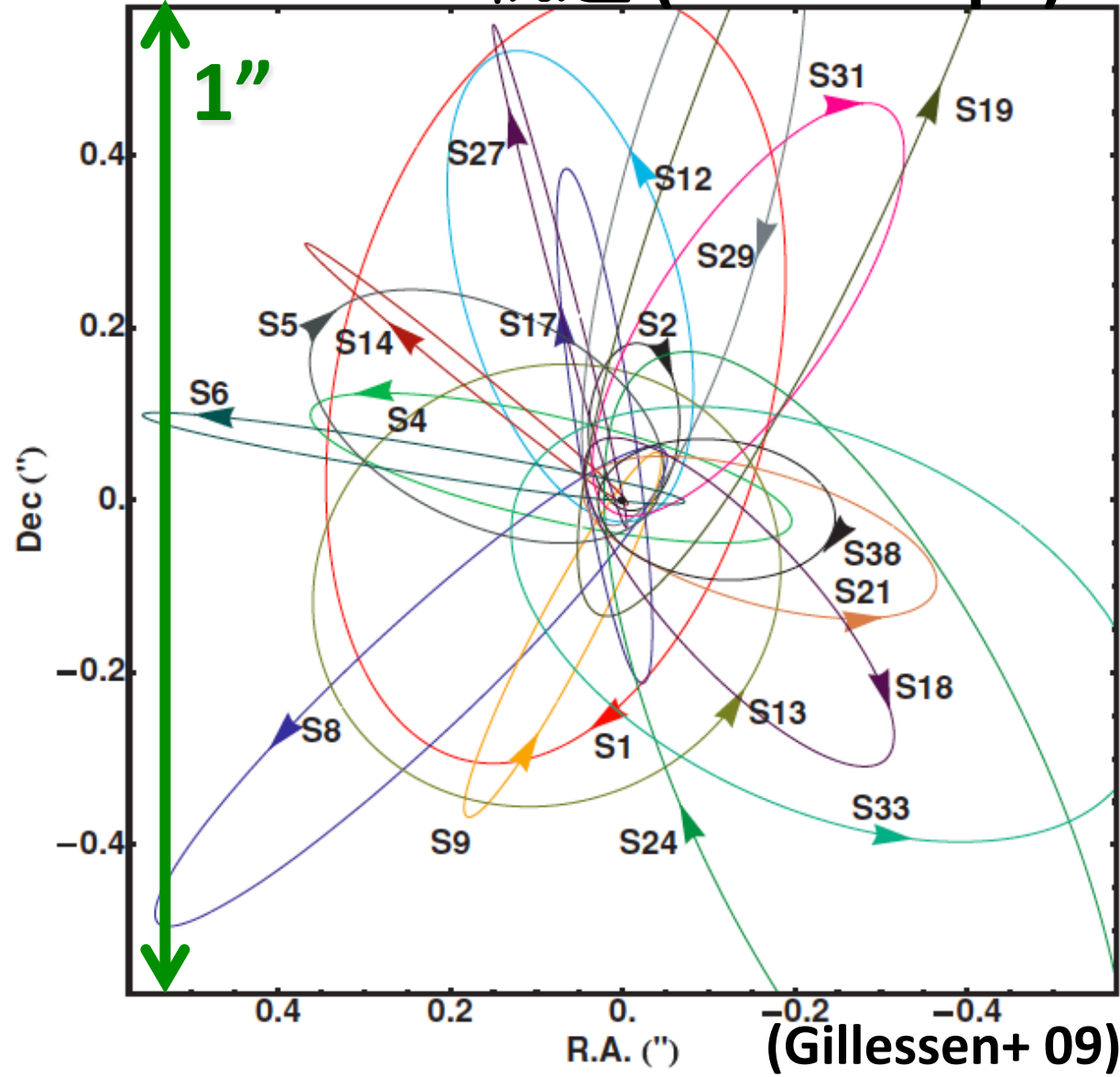
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Keck + Current AO

Keck + NGAO

30 m ELT + AO



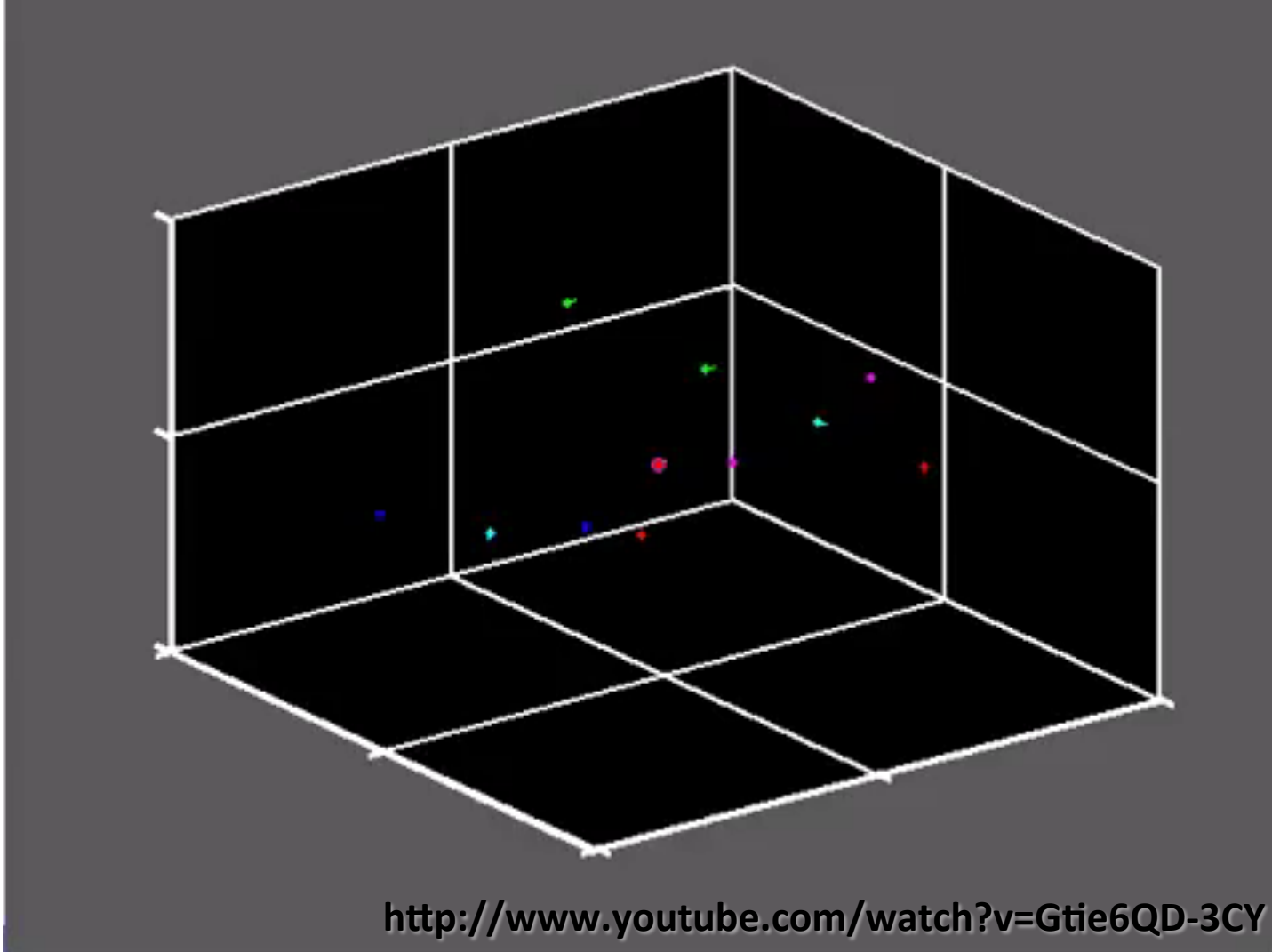
S-starsS-Starsの軌道 ($<1''=0.04\text{pc}$)S-stars

→SMBHの
質量、距離
密度の下限值
軌道パラメータ

Hyper Velocity Stars

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Hyper velocity stars in Halo (Brown+05, 06, 07, 09)

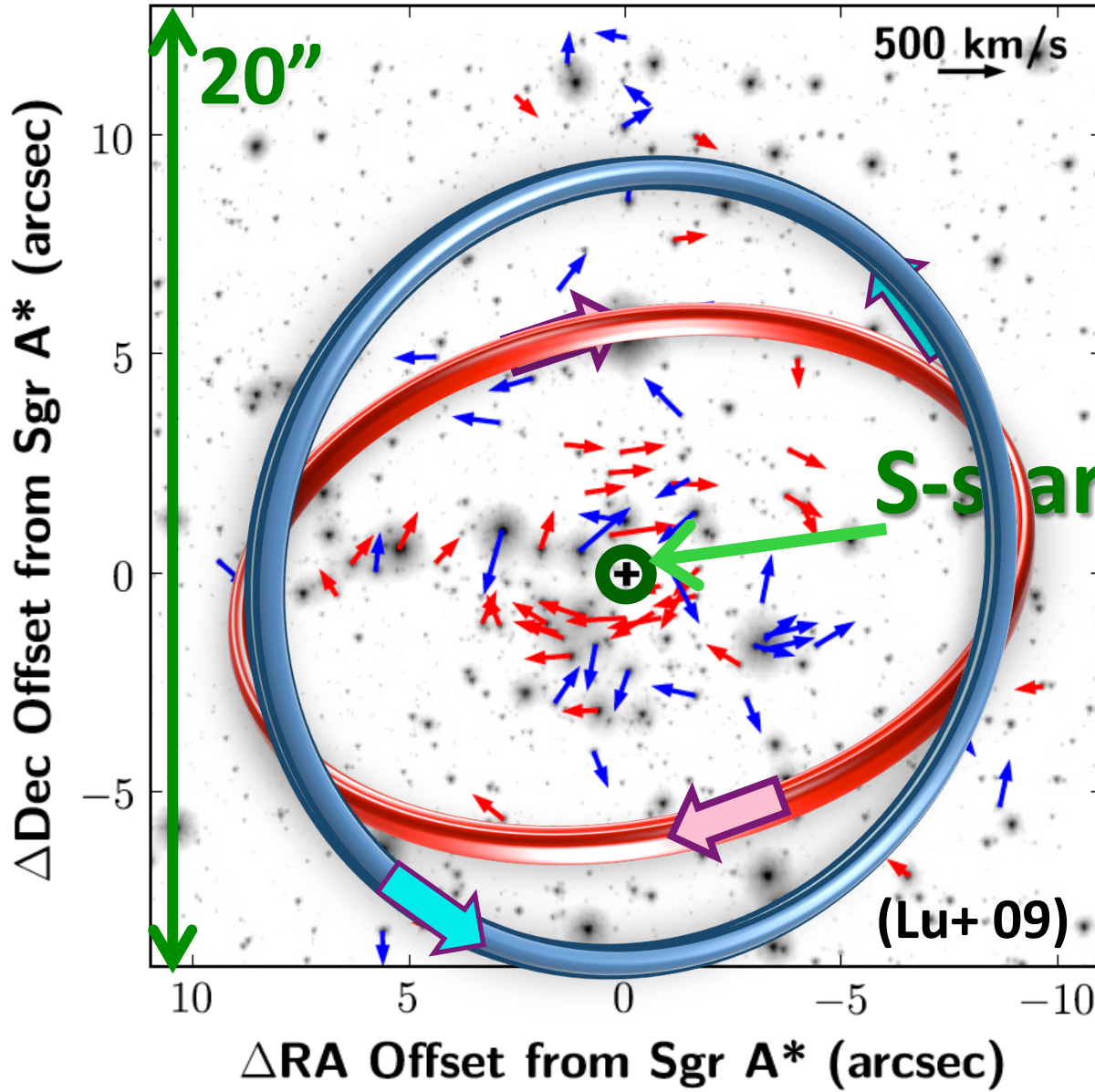


SMBHの間接証拠、相互作用、星形成

Young Stellar Disk(s)

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stellar disk 内の運動(<20''=0.8pc)



Stellar-disk (s)

若い星 (OB, WR, ...)

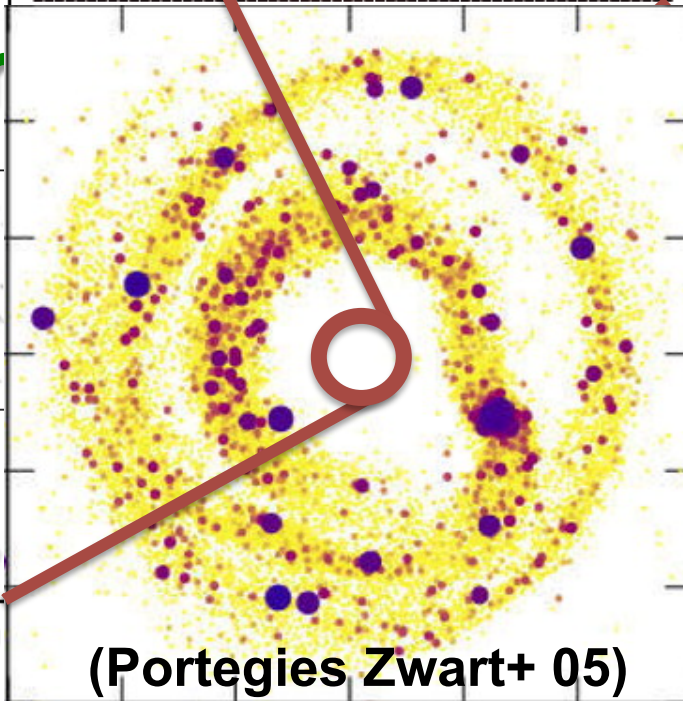
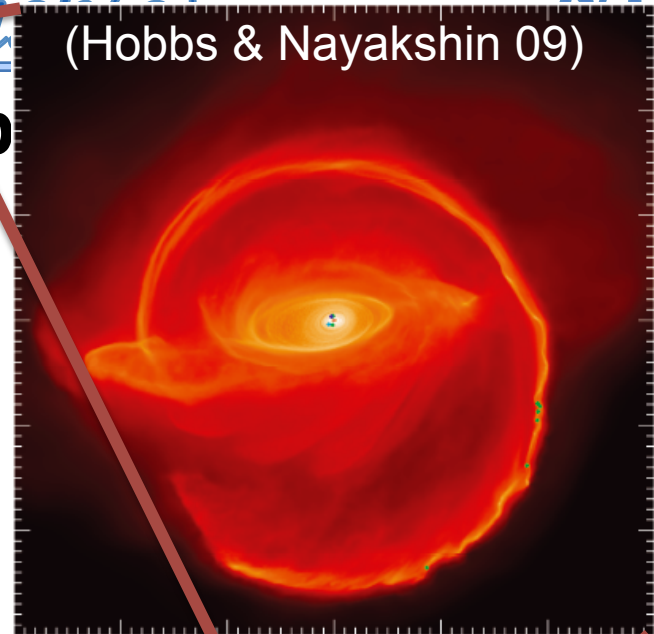
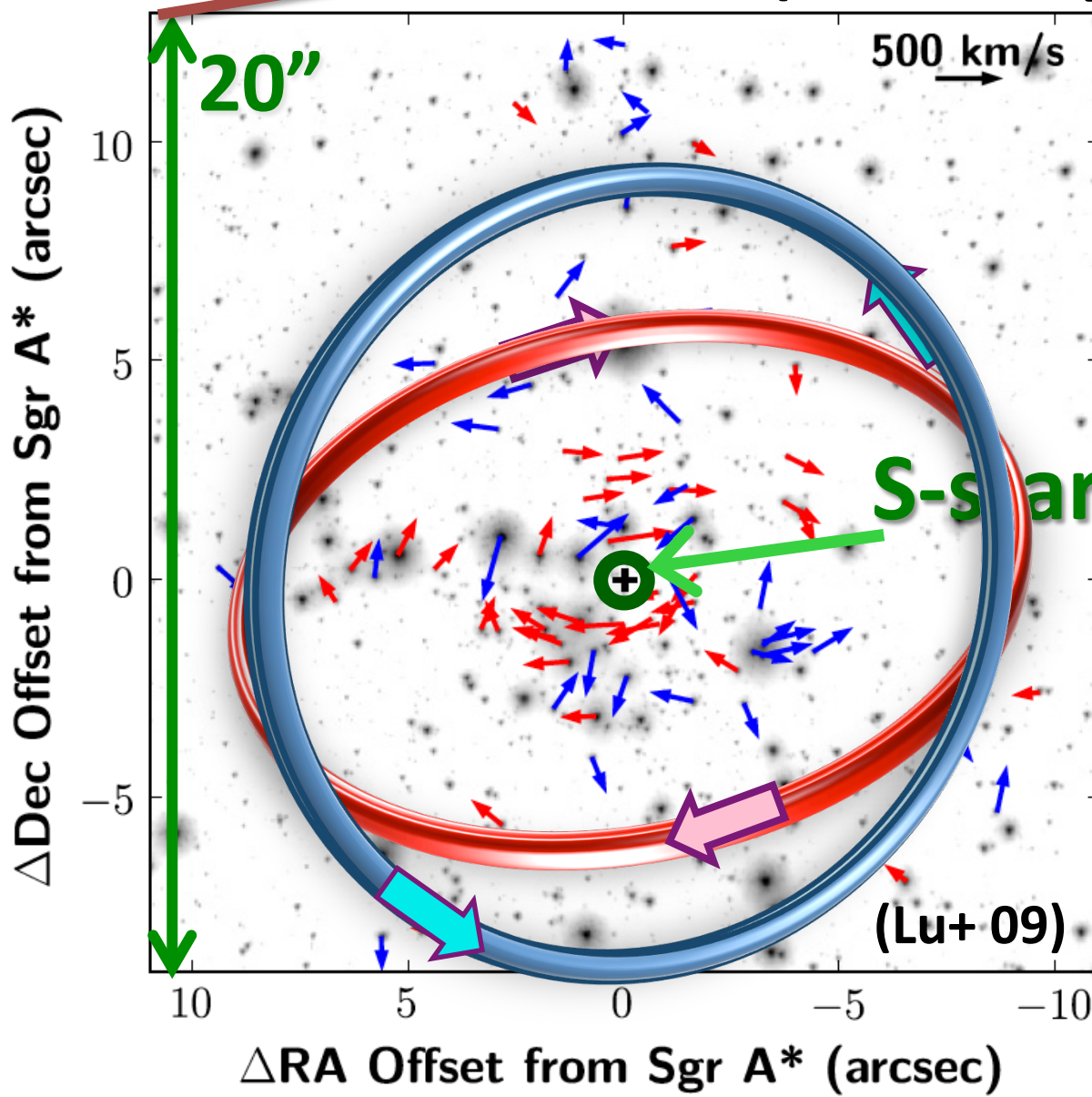
→ SMBH周囲

(強重力場)

での星形成?

(Hobbs & Nayakshin 09)

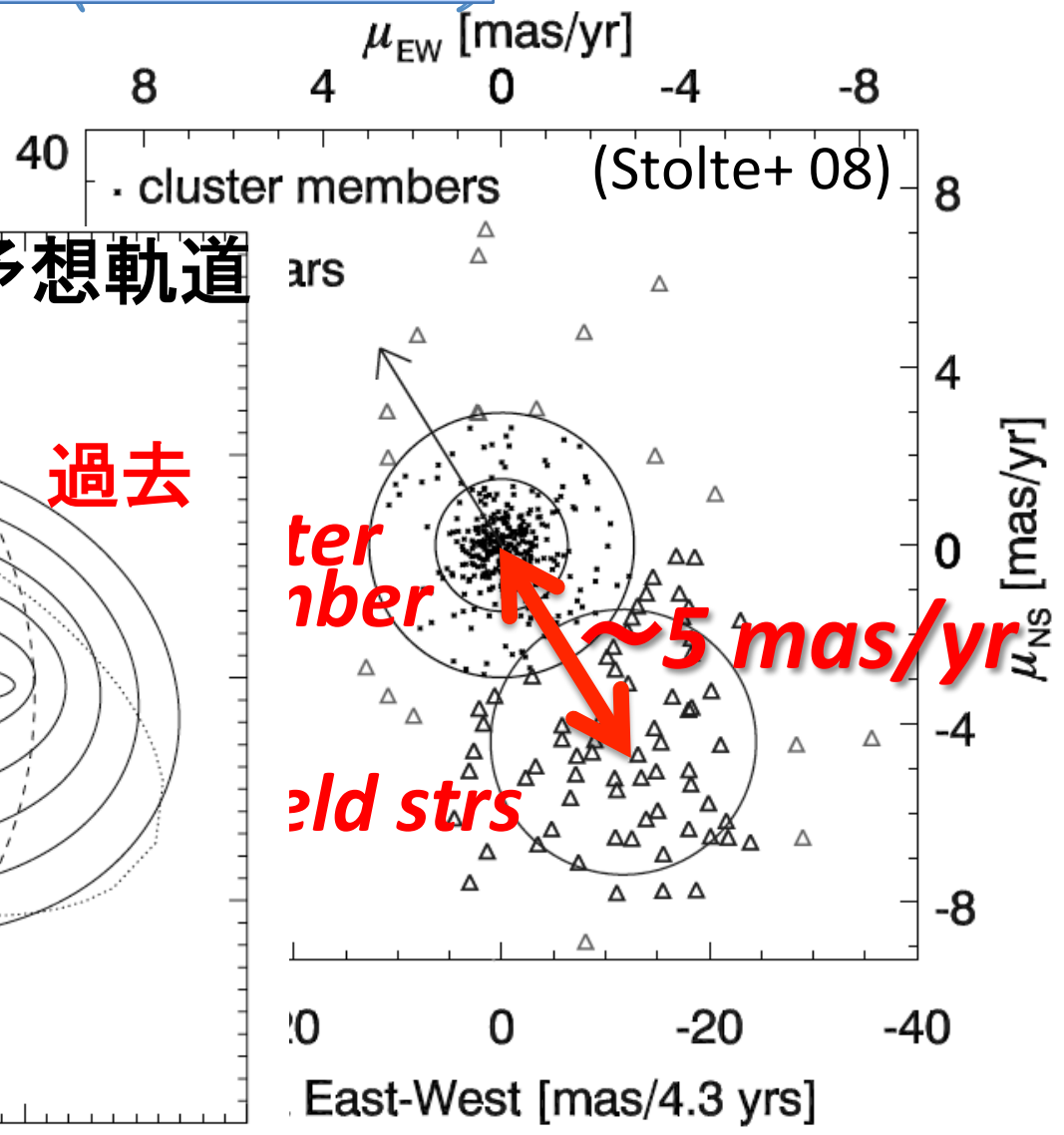
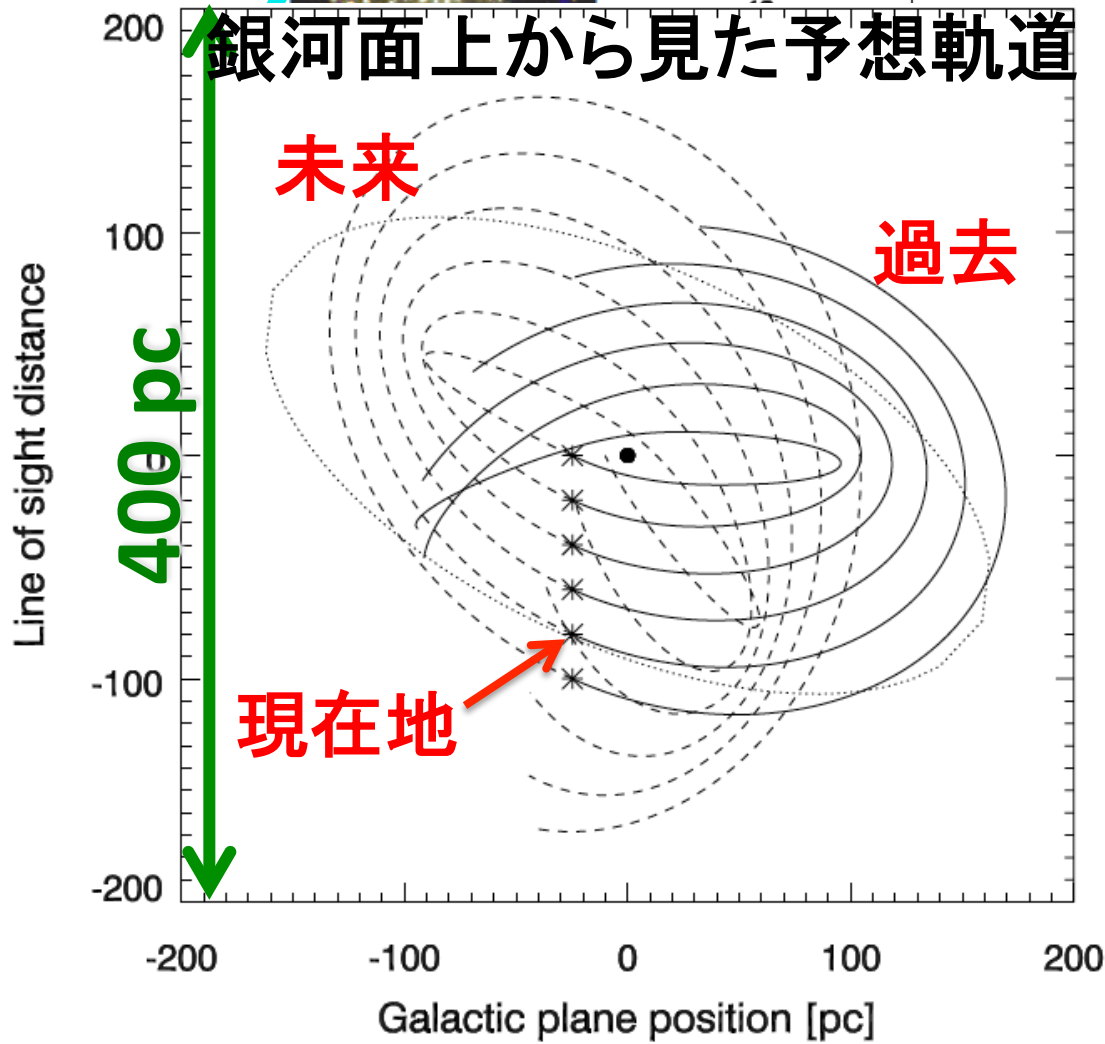
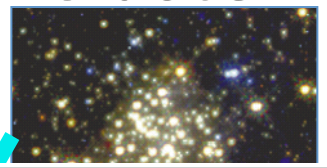
stellar disk 内の運動 (<20" = 0.8 pc)



(Lu+ 09)

(Portegies Zwart+ 05)

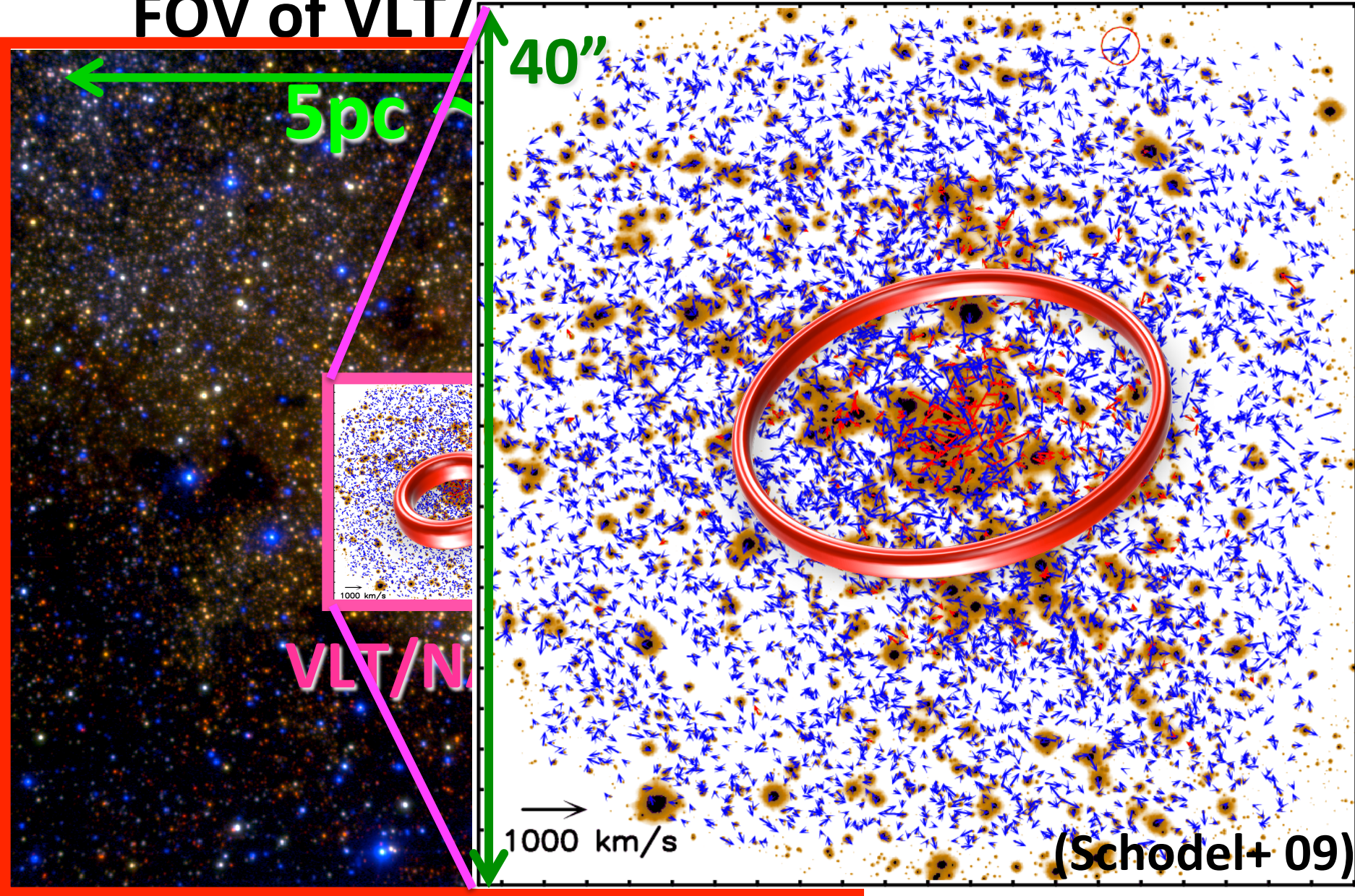
Arches Cluster Cluster (Remnant)



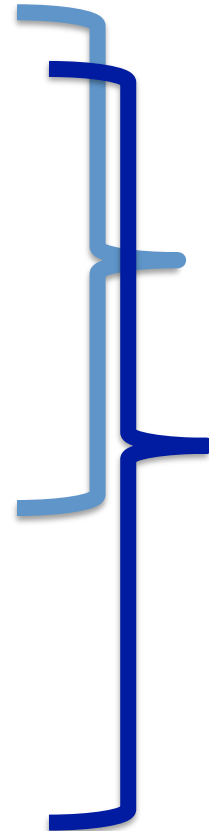
Nuclear Star Cluster

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FOV of VLT/NACO



	範囲
S-stars	1''
Hyper Velocity stars	-
Nuclear Star Cluster	~5'
Clusters	~10'



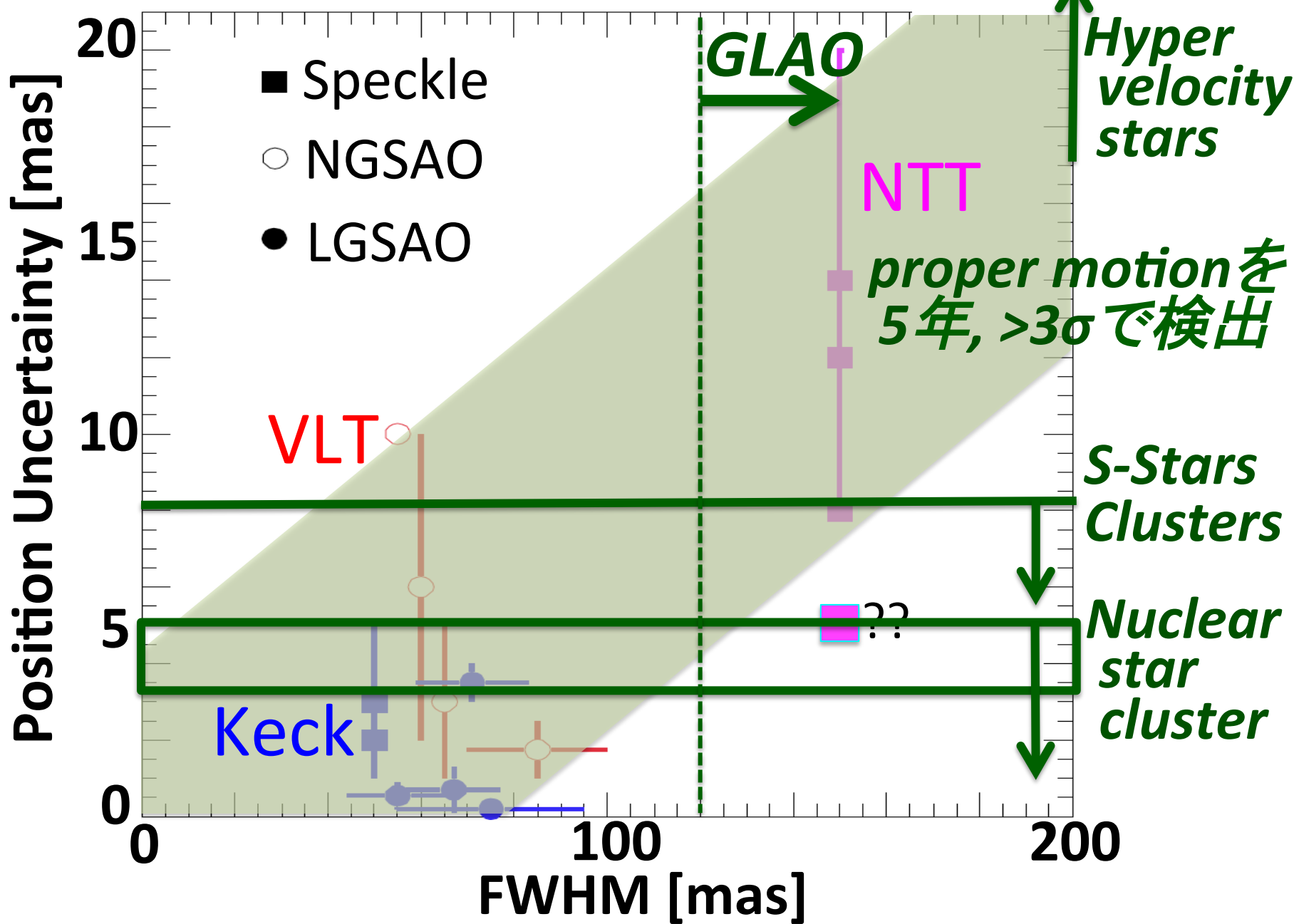
- SMBH
- BH近傍の物理
- 星・星団形成
- 共進化

Proper Motion

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	範圍	速度 [km/s]	typical proper motion
S-stars	1''	数×100	~ 5 mas/yr
Hyper Velocity stars	-	> 1000	25 mas/yr
Nuclear Star Cluster	~5'	~ 100	a few mas/yr
Clusters	~10'	~ 200	~5 mas/yr

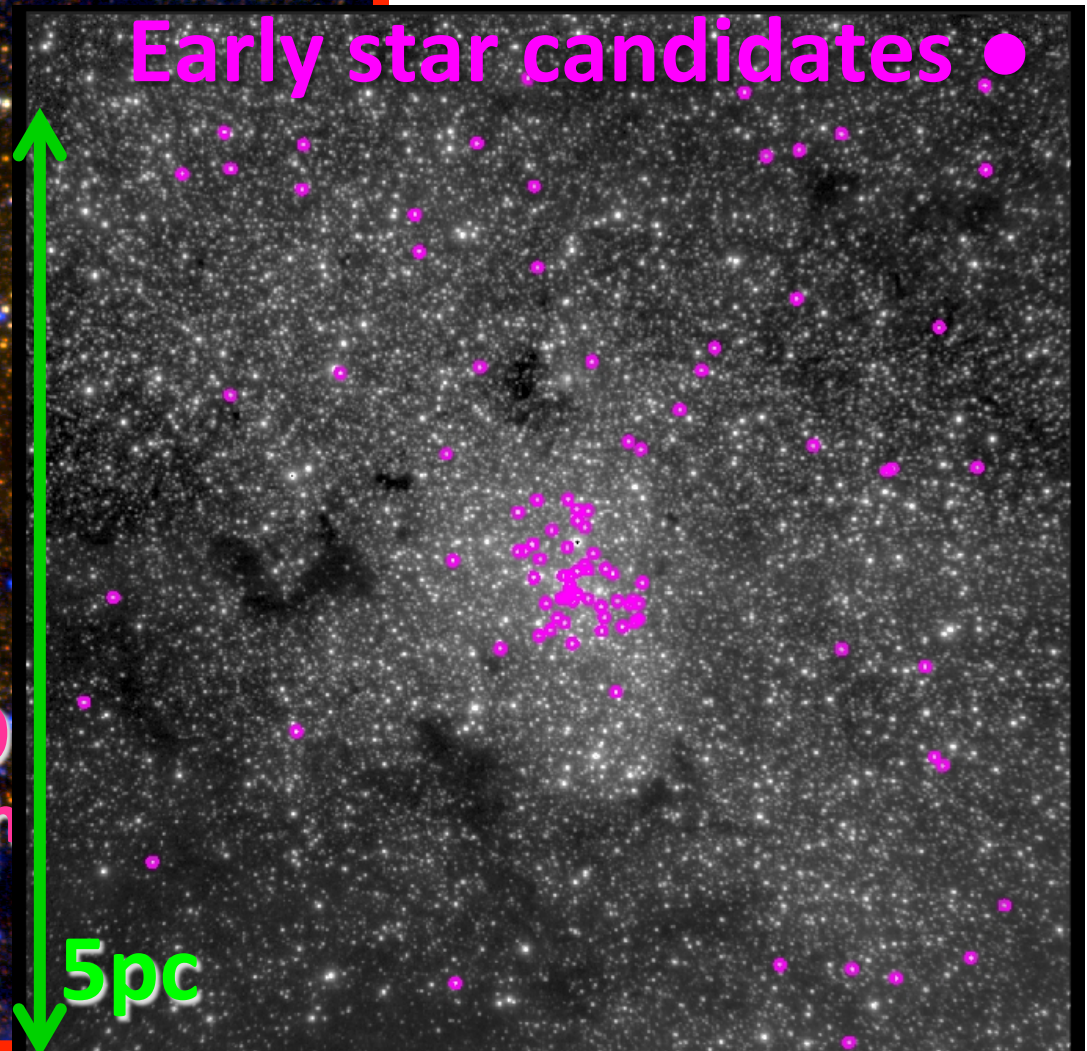
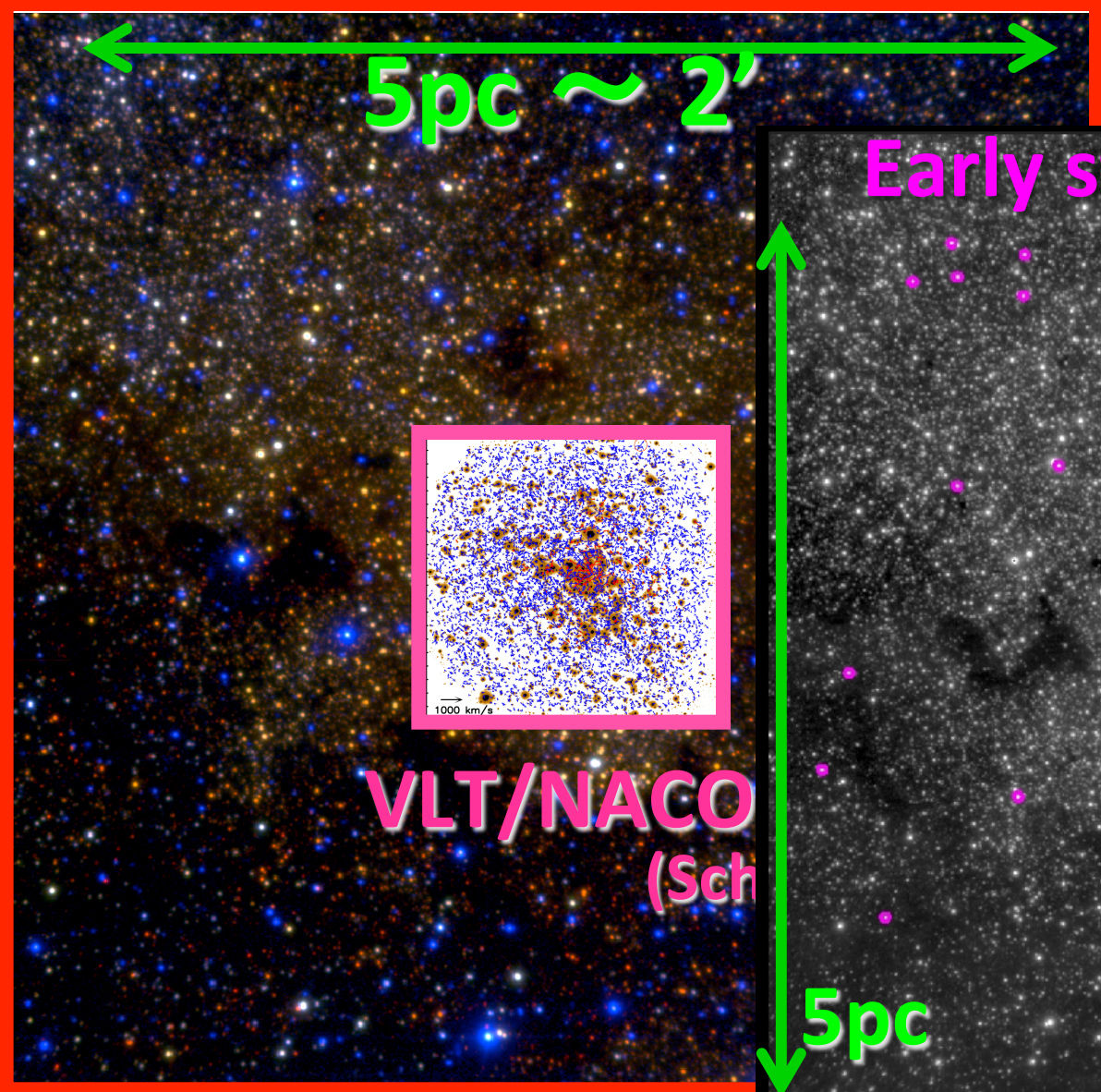
星のFWHMと位置精度の関係 13/15



Search for Cluster Remnant

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FOV of VLT/ISAAC



- Astrometry による研究@銀河系中心
 - S-stars
 - Nuclear star cluster
 - Stellar cluster (remnant)
 - Hyper velocity stars
- NSC, Cluster, HVSは視野(> 5')が重要
- a few mas yr⁻¹ を検出したい for NSC
 - 位置精度 < 5 mas → FWHM ~ 100 mas?
- Clusterは FWHM ~ 150 mas ?
- HVSはOK (300 - 400 mas)
- Speckle (movie mode in IRCS) は重要。