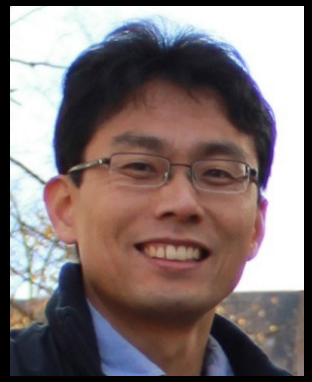
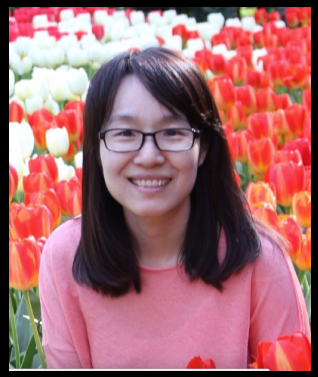
Korea-ALMA Report

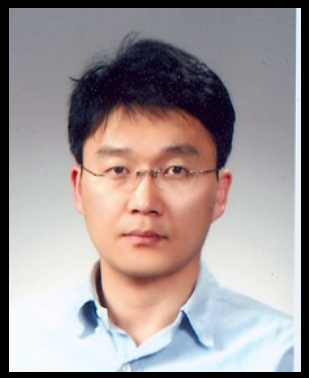
Aran-Lyo
Jongsoo Kim and
Members of ALMA group in KASI

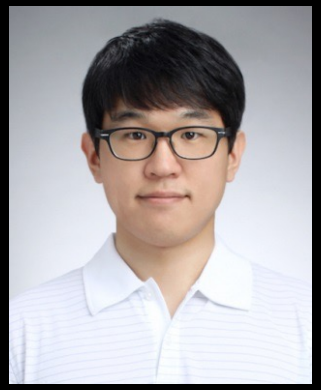
People in EA ARC Korean Node (http://alma.kasi.re.kr)







ARC Korean Node

- QA2 (qualification assurance phase 2)
  - A-Ran Lyo, Woojin Kwon, Kijeong Yim, Se-Heon Oh
- P2G (phase 2 generation)
  - Jihyun Kang, Se-Heon Oh
- AoD (Astronomer on Duty)
  - A-Ran Lyo (2 shifts, July-August)
  - Sujin Kim (Solar observation, December)

Town Hall Meeting 2016

KIAS: 18 March

SNU : 21 March

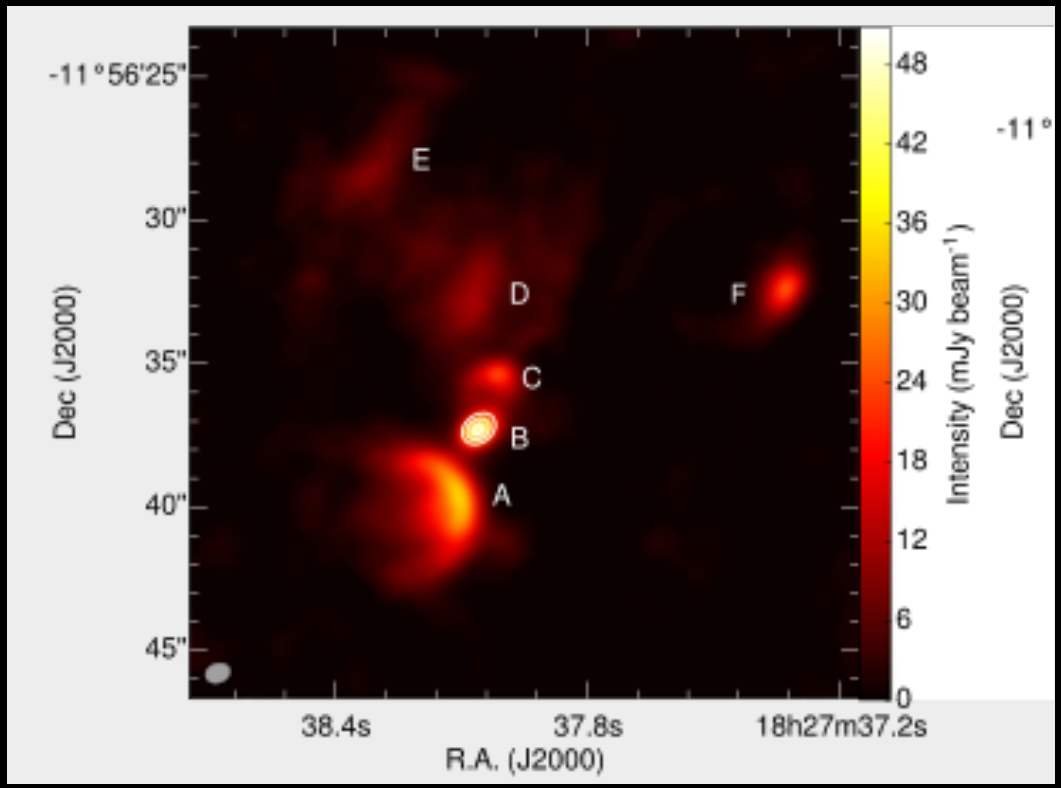
KASI: 28 March

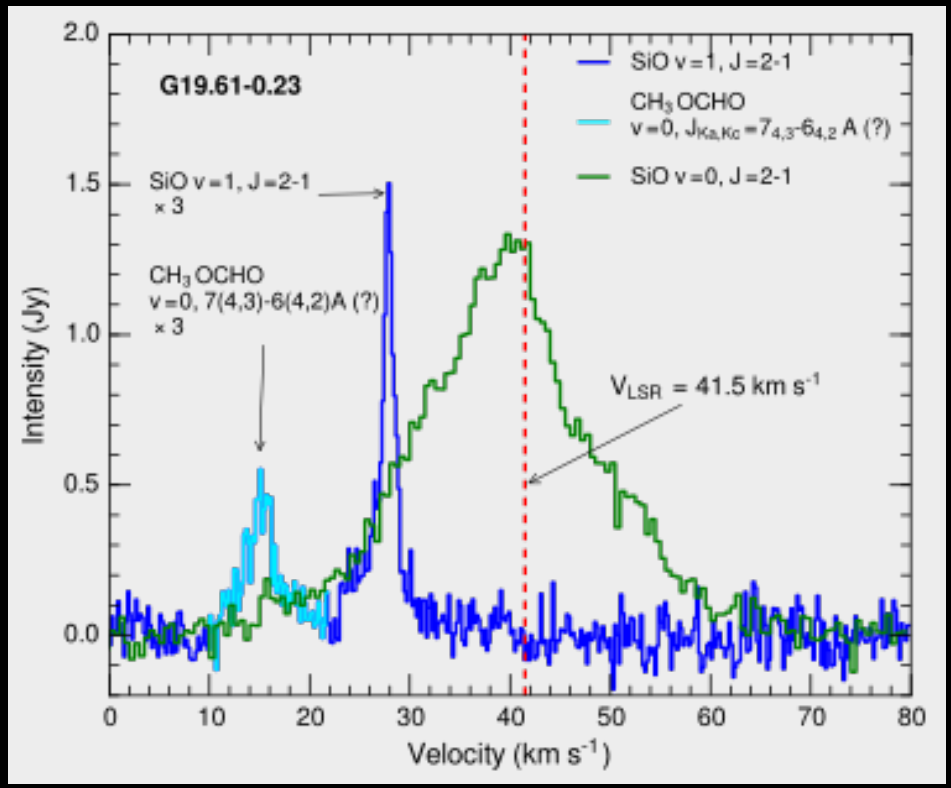
Statistics for ALMA Korean Proposals

Cycle	*deadlines*	*submitted*	*Proved*
C2	*5 Dec 2013*	*18*	*4*
C3	*23 Apr 2015*	*25*	*6*
C4	*21 Apr 2016*	*35*	*8*

G19.61+0.23

(Cho et al. 2016, ApJ, 826, 157)





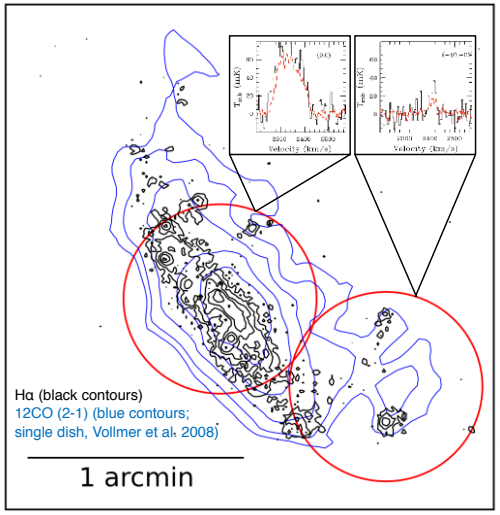
3.5mm continuum (color) + SiO maser (contour)

A case study of extraplanar molecular gas in a Virgo spiral using the ALMA

Bumhyun Lee & Aeree Chung
Department of Astronomy, Yonsei University

NGC 4522 (a Virgo spiral) provides an opportunity to **study the impact of ICM pressure on the dense/star forming gas and its fate in the extraplanar space after stripping**.

The ALMA observations (cycle 3)



12m array

In band 3,

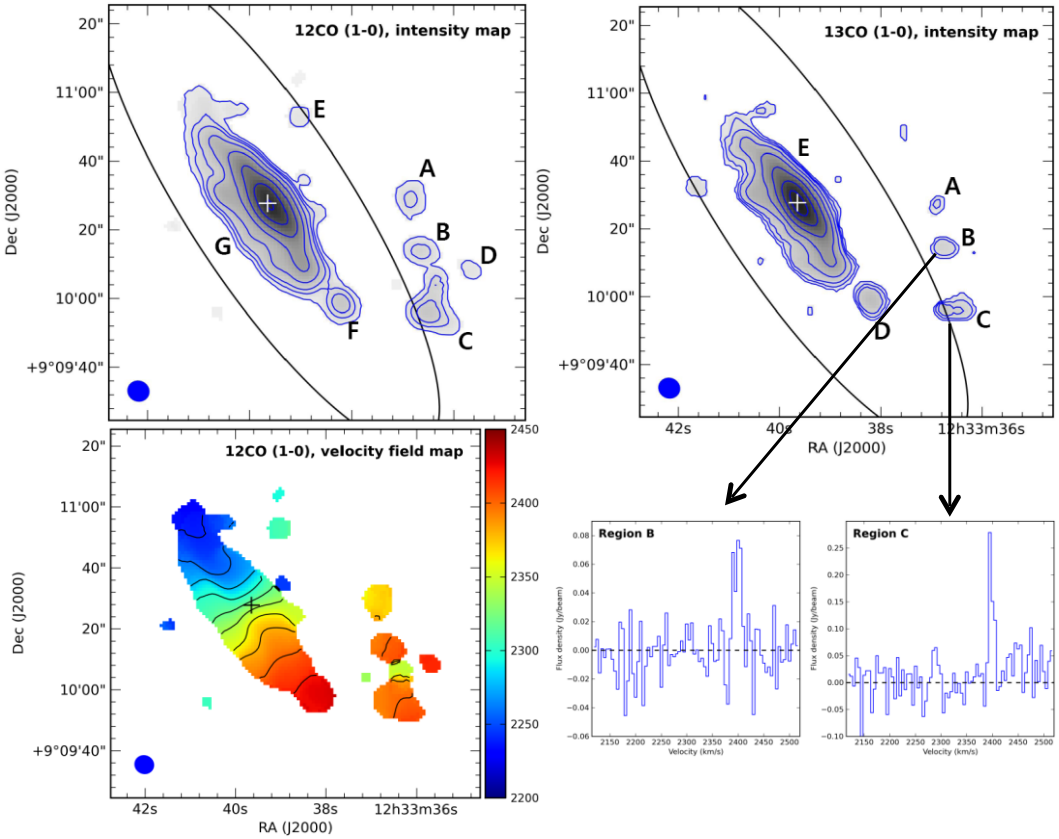
12CO (1-0); 115.271 GHz
13CO (1-0); 110.201 GHz

In two regions,

the center of the galaxy
the peak of extraplanar CO

January 12 (12CO, 46 antennas), January 19 (13CO, 43 antennas), 2016
On-source time: ~51 min (12CO) and ~276 min (13CO)
Shortest baseline: 15m, Longest baseline: 331m
RMS (~6 arcsec using 'taper' and 5 km/s) noise:
~2.1 mJy/beam (12CO)
~0.7 mJy/beam (13CO)

The ALMA CO data

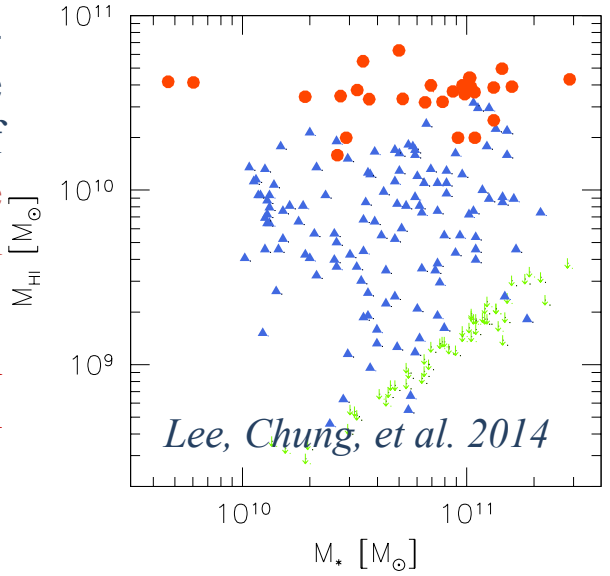


The first case where 13CO gas has been detected outside the stellar disk in a galaxy undergoing ram pressure stripping.

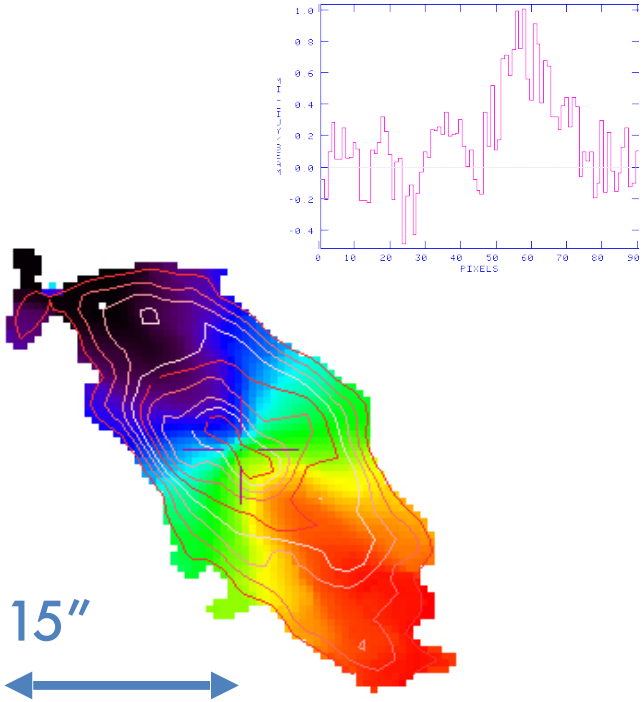
The Molecular Gas Properties of HI Monsters ALMA science case (Cycle 3)

Aeree Chung (Yonsei), Daisuke Iono (NAOJ), Min S. Yun (Umass)

HI Monsters: Galaxies with extremely high HI-to-stellar mass ratio at 0.04 < z < 0.08 identified in ALFALFA survey (z limited by the depth of the ALFALFA catalog in 2008 and the CO coverage of the upper most band of the redshift search receiver built for the Large Millimeter Telescope): Figure – M(HI) vs. M(star) of COLDGASS sample in blue with upper limits in green for non detections (Saintonge 2011, MNRAS, 415, 32). HI Monster sample in red.



Also large molecular gas mass of the HI monster sample as inferred from single-dish CO observations, yet star forming is not active for such high cool/cold gas mass → What are they in the context of galaxy evolution?



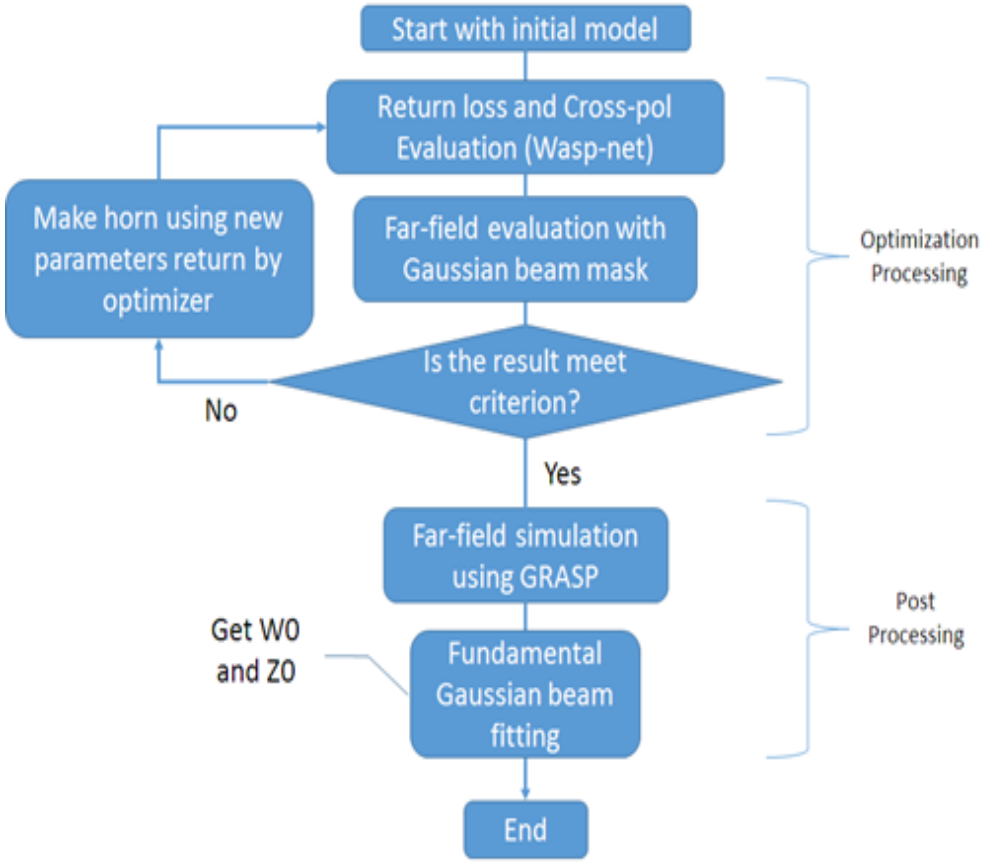
Questions for the ALMA: How gas and star formation are regulated in these galaxies with a large gas reservoir?

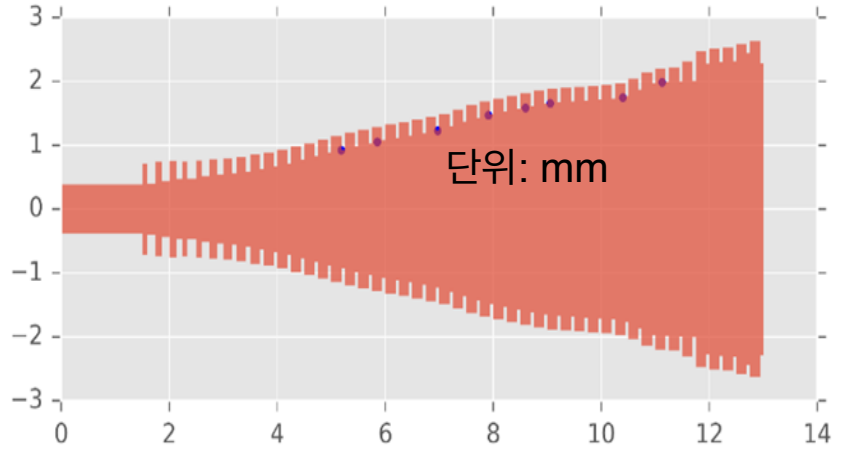
Overall, regularly rotating molecular gas disk, yet various peculiarities in kinematics→ **in the process of accretion or structural formation?**

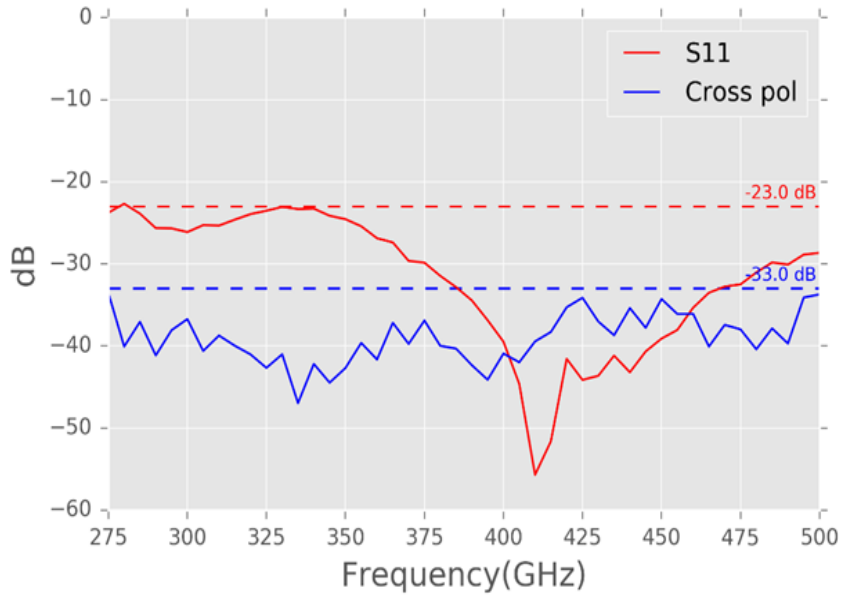
No other telescope can image the molecular gas of these systems with this resolution (>10 elements across the disk) in reasonable integration hours (~ a few hrs in this case)

ASTE/ALMA multibeam receiver system

1) Wide band (ALMA B7+B8) feed horn



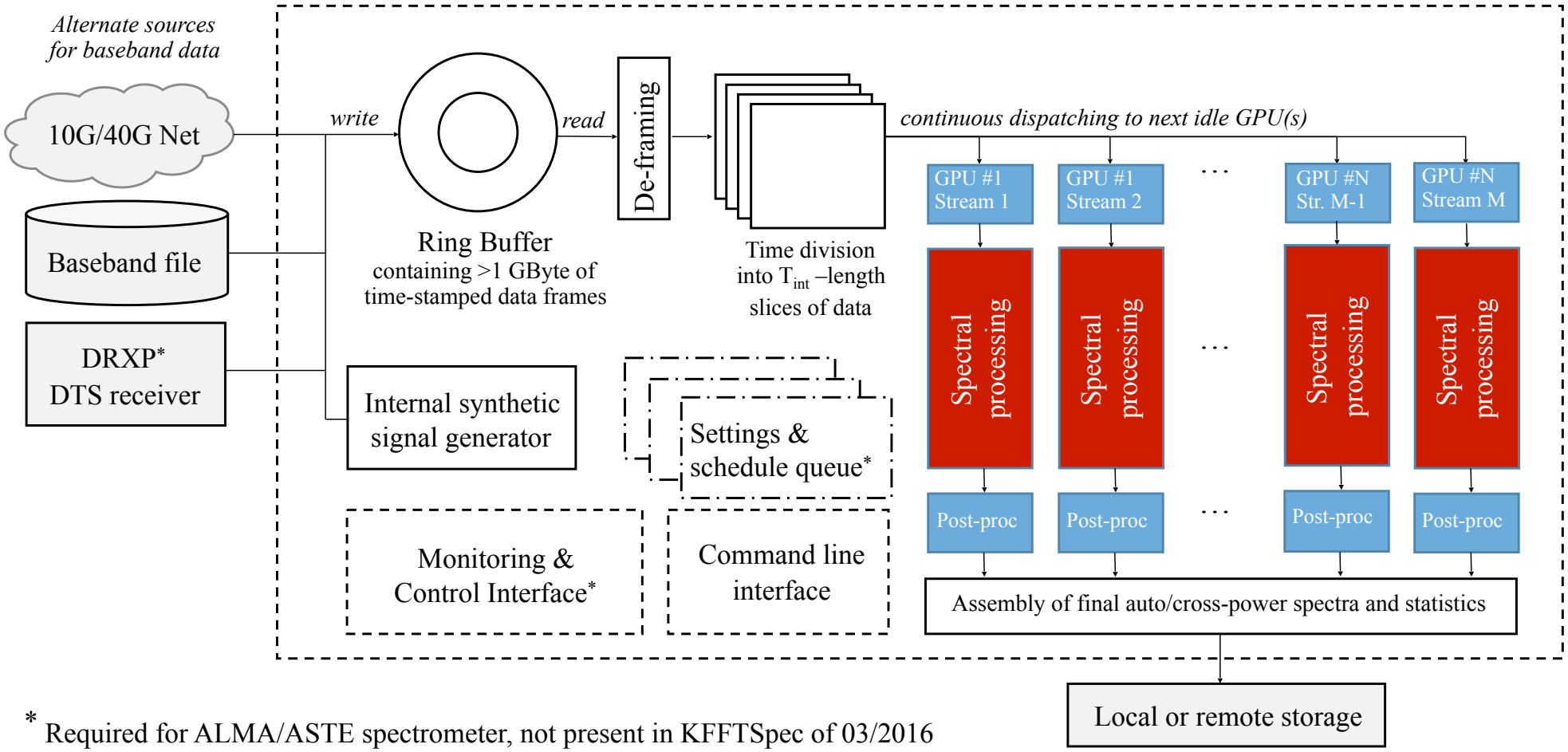




S11: reflection

2) GPU Spectrometer

KFFTSpec: data flow and functions inside GPU server



* Required for ALMA/ASTE spectrometer, not present in KFFTSpec of 03/2016

H_2O and SiO maser lines