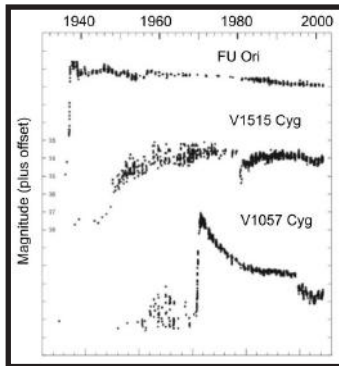


# Millimeter Variability in FUor Objects

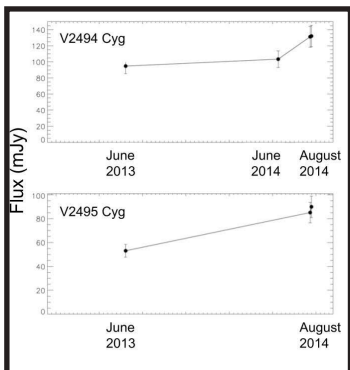


## What are FUor Objects?

- Young, low-mass stars that have undergone massive accretion outbursts
- Enhanced accretion lasts for 100+ years
- Outburst mechanism not fully understood
- Could explain how stars accrete much of their mass so quickly



## Evidence of Millimeter Variability



25+% variability at 2.7 mm on ~1 year timescale

Hinders accurate disk mass estimates

- They often utilize mm fluxes
- Important to determine FUor outburst mechanism

## Our Study

NOEMA Interferometer - 2.7 mm

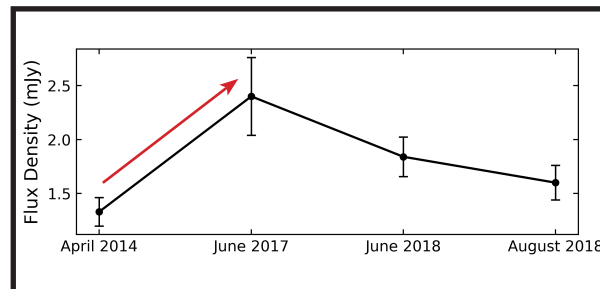
### Three Targets

V1735 Cyg  
V2494 Cyg  
V2495 Cyg

### Four Epochs

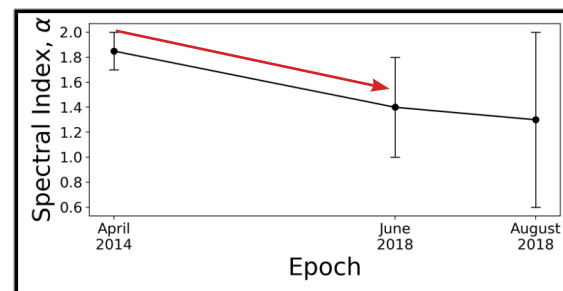
April 2017  
June 2017  
June 2018  
August 2018

## Results



~80% flux increase at V1735 Cyg

+



Decrease in mm spectral index

## What does this mean?

$$\text{Flux Increase} + \text{Spectral Index Decrease} = \text{Free-free Emission Increase}$$

A temporary increase in the accretion rate may eject more material into the jet, increasing the contribution of free-free emission. More free-free emission means higher total mm flux and lower spectral index.

This increased free-free emission, in turn, would contaminate mm fluxes, leading to overestimated disk masses

## Conclusions

- FUors represent an important stage of stellar evolution
- mm Variability seen in FUor objects at 1.3 and now at 2.7 mm
- May be due to an increase of free-free emission from accretion
- Free-free emission could contaminate mm fluxes, leading to overestimated disk masses

See my paper: [“A Study of Millimeter Variability in FUor Objects”](#) for more info!