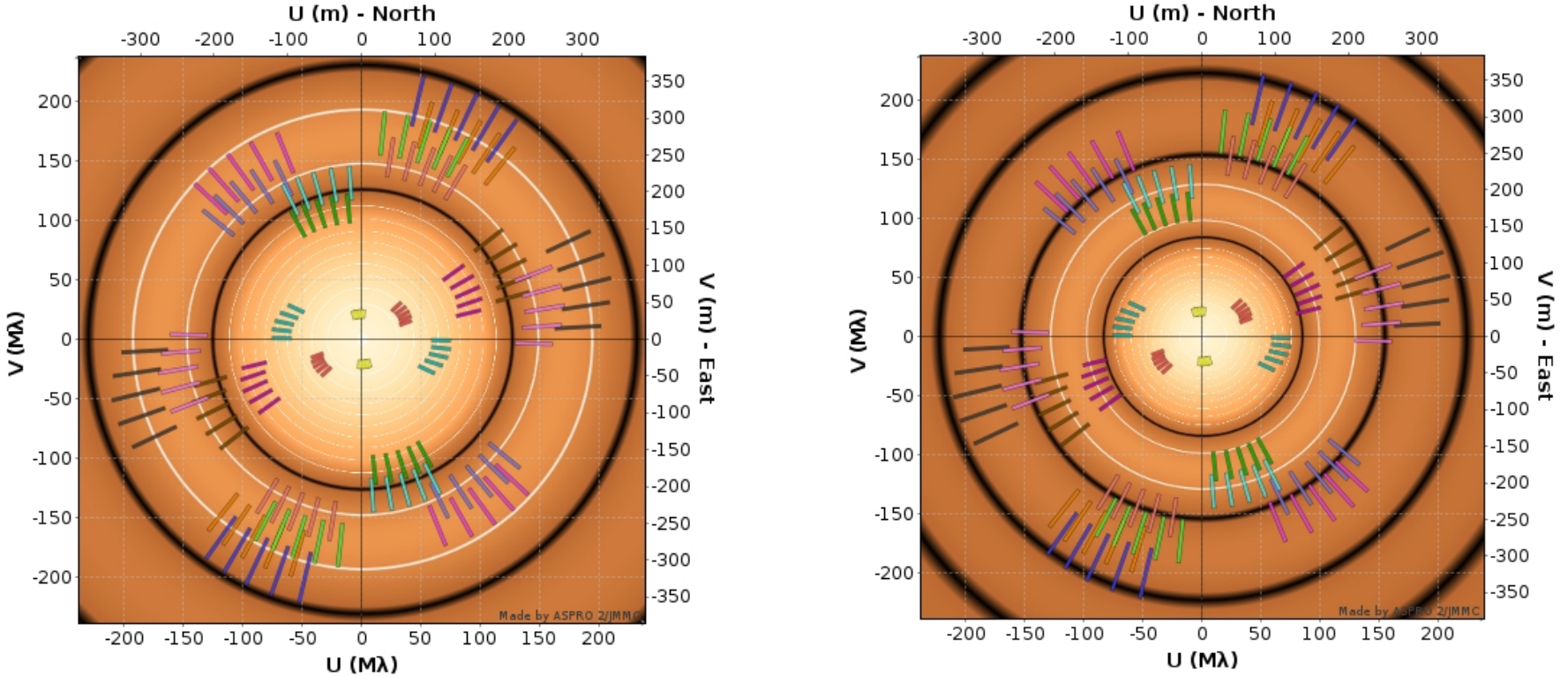
Observational and Science Goals

- Higher angular resolution
  - longer baselines
  - shorter wavelength
- Imaging
  - increase (u,v) coverage
  - intermediate baselines
- Fainter targets
  - larger apertures
  - higher efficiency optics

Science Drivers

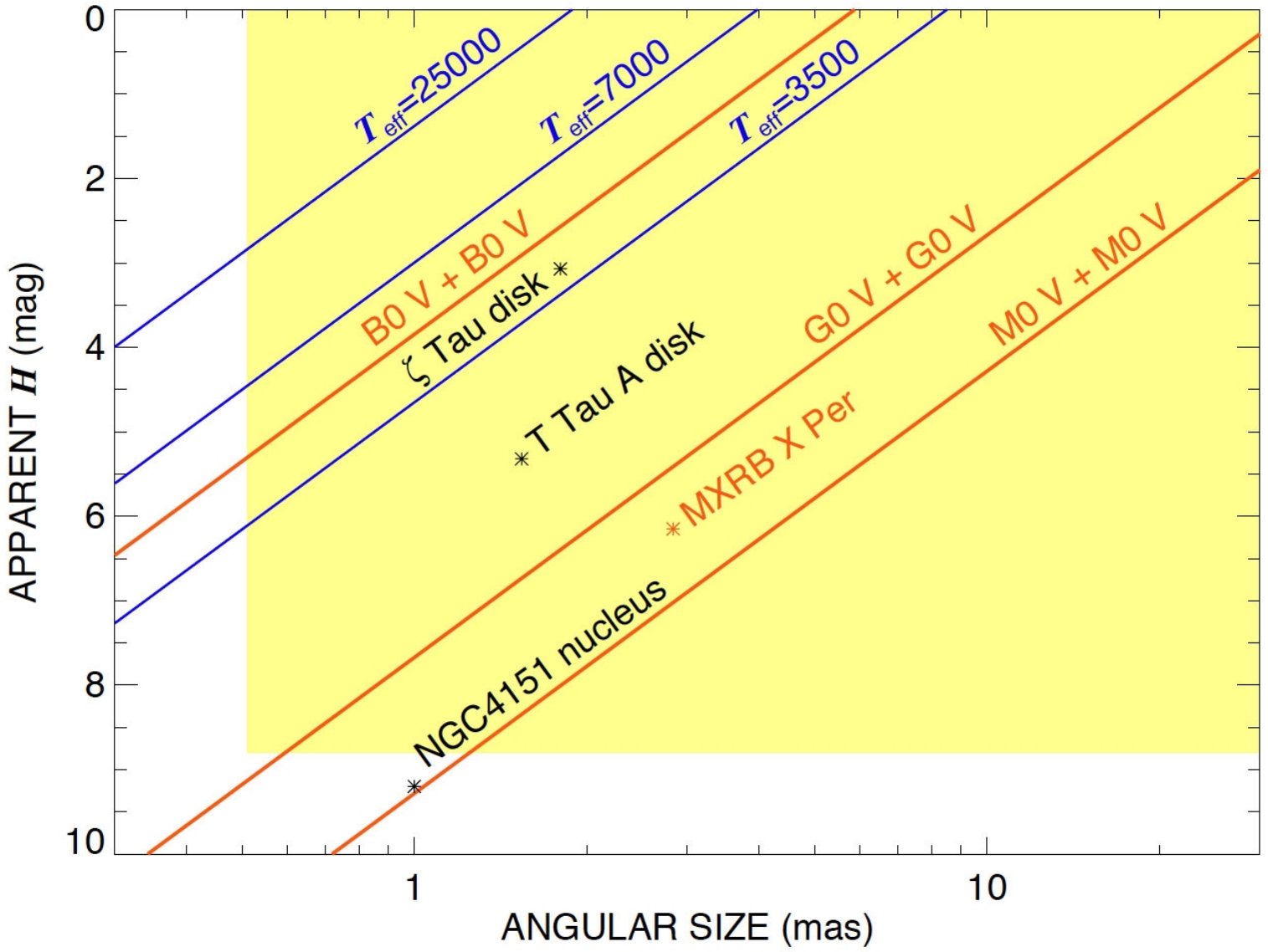
- Sizes of hot stars
- Spots on solar type stars
- Young stars (disks + binaries)
- Transiting planet surveys (TESS)
- Active Galactic Nuclei

Maximum Angular Resolution vs. Stellar Imaging

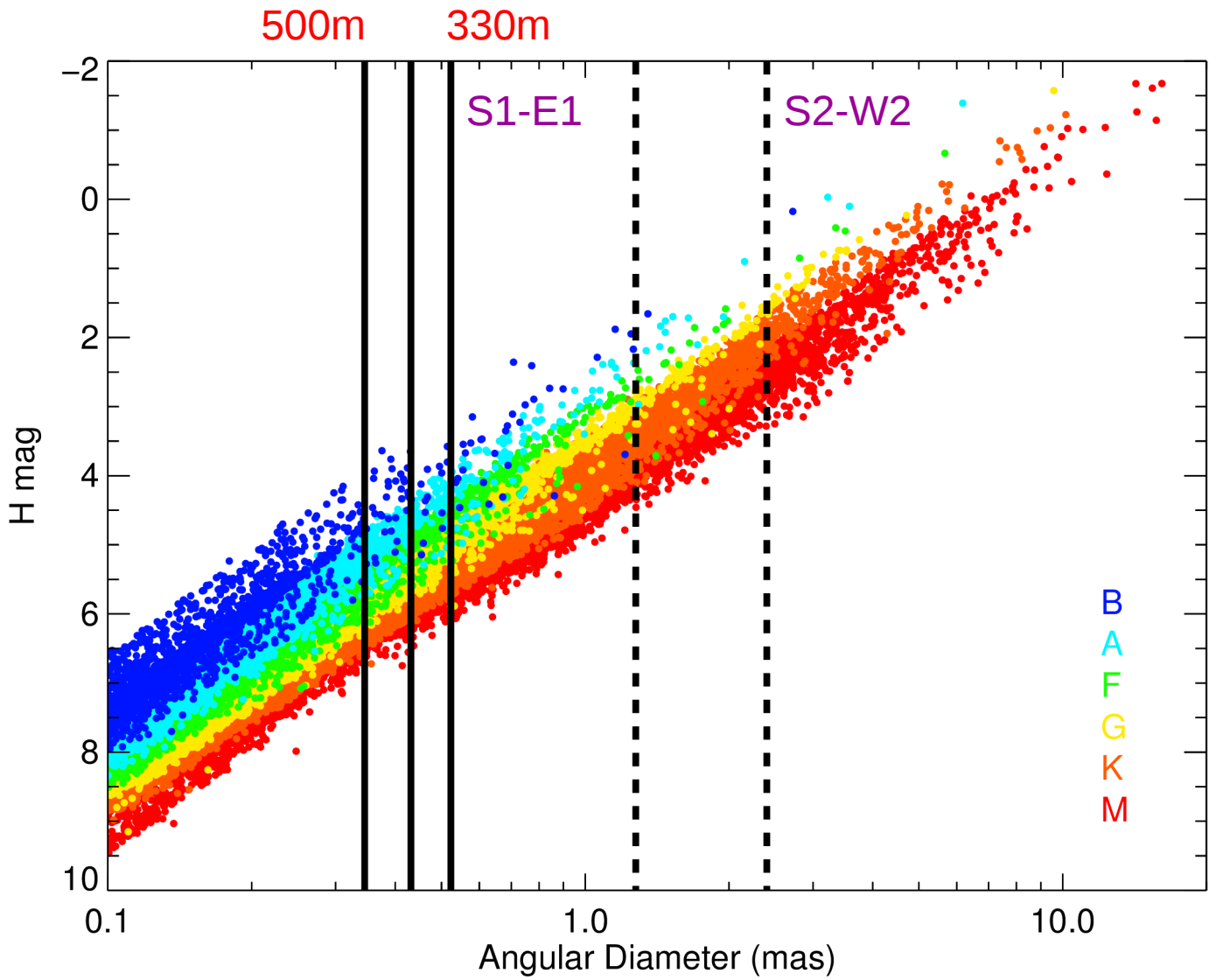


- S1S2, E1E2, W1W2, W2E2, W2S2 within first lobe:
  - θ = 3.0 mas in K-band
  - θ = 2.4 mas in H-band
  - θ = 0.92 mas in R-band

Working limits for Classic:
stellar diameters, disk diameters, binary star separations (P=10d)



How many stars resolved: Increase maximum baseline

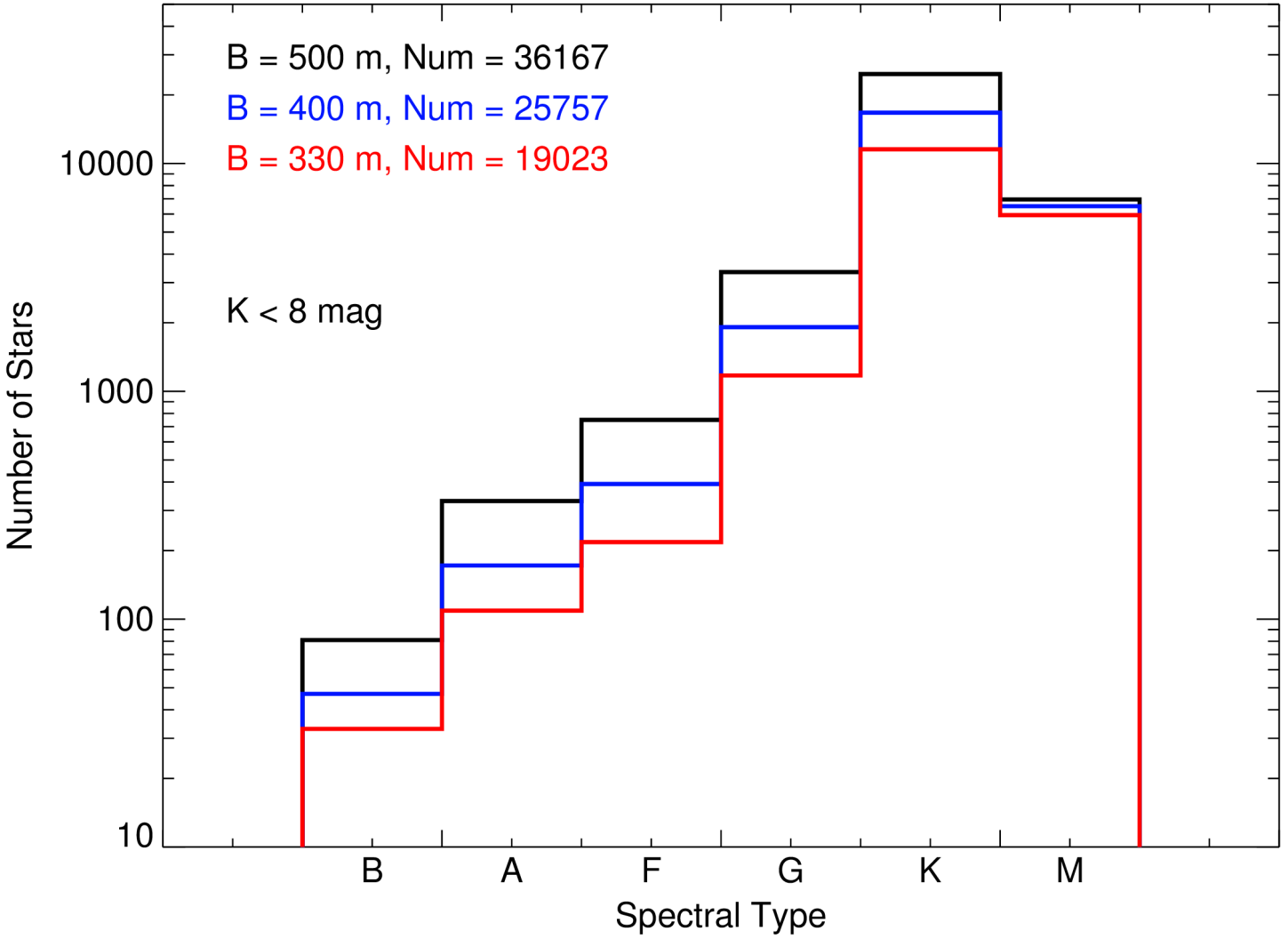


JMMC Stellar Diameter Catalog

DEC > -20°
V < 15 mag
H < 10 mag
θ > 0.1 mas

Nstar = 98,872

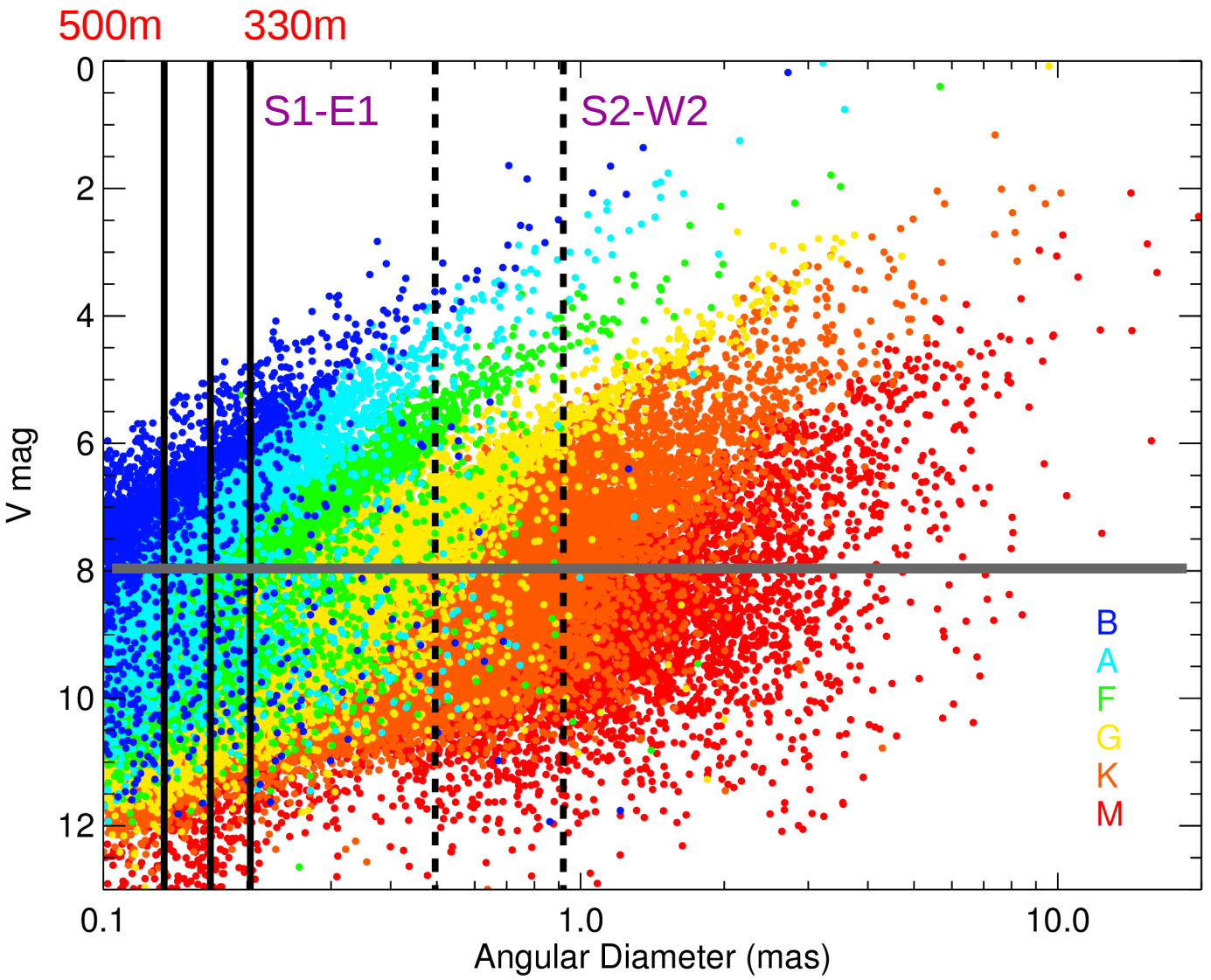
How many stars resolved: Increase maximum baseline



Difficult Imaging Targets:

N = 1004

How many stars resolved: Increase maximum baseline

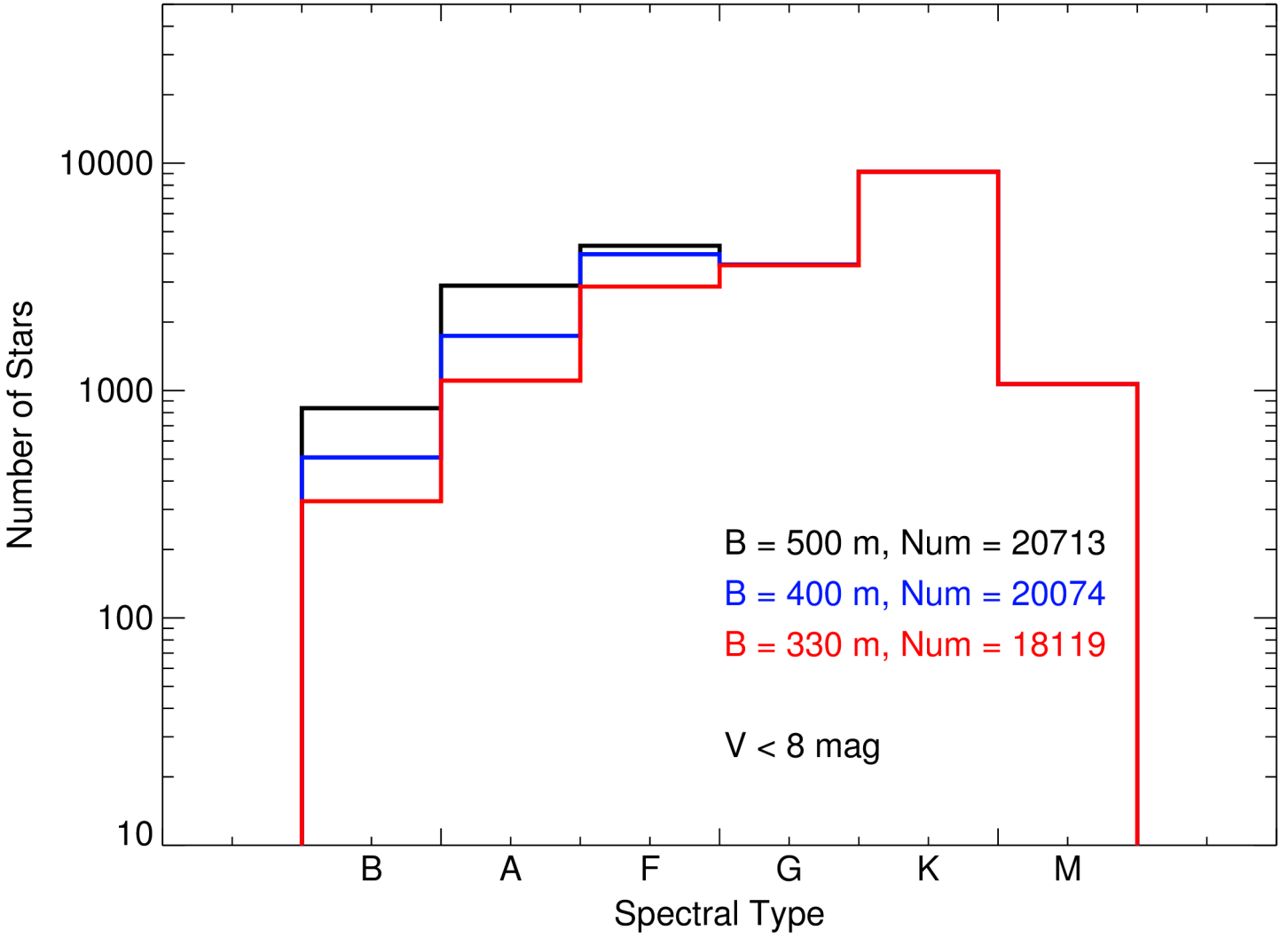


JMMC Stellar Diameter Catalog

DEC > -20°
V < 8 mag
θ > 0.1 mas

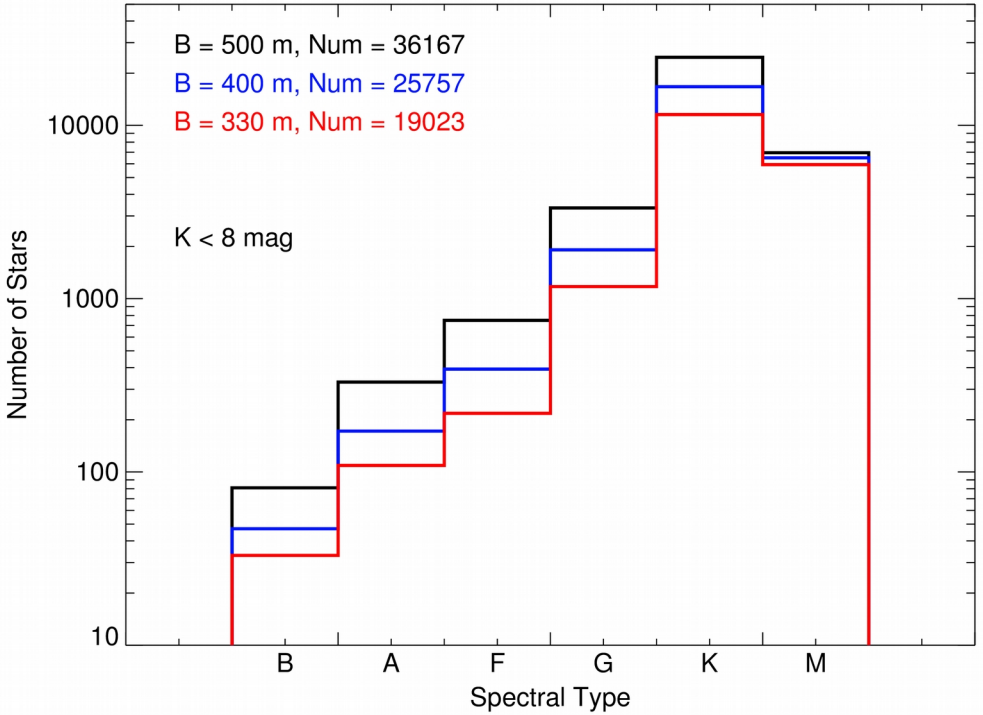
Nstar = 20,713

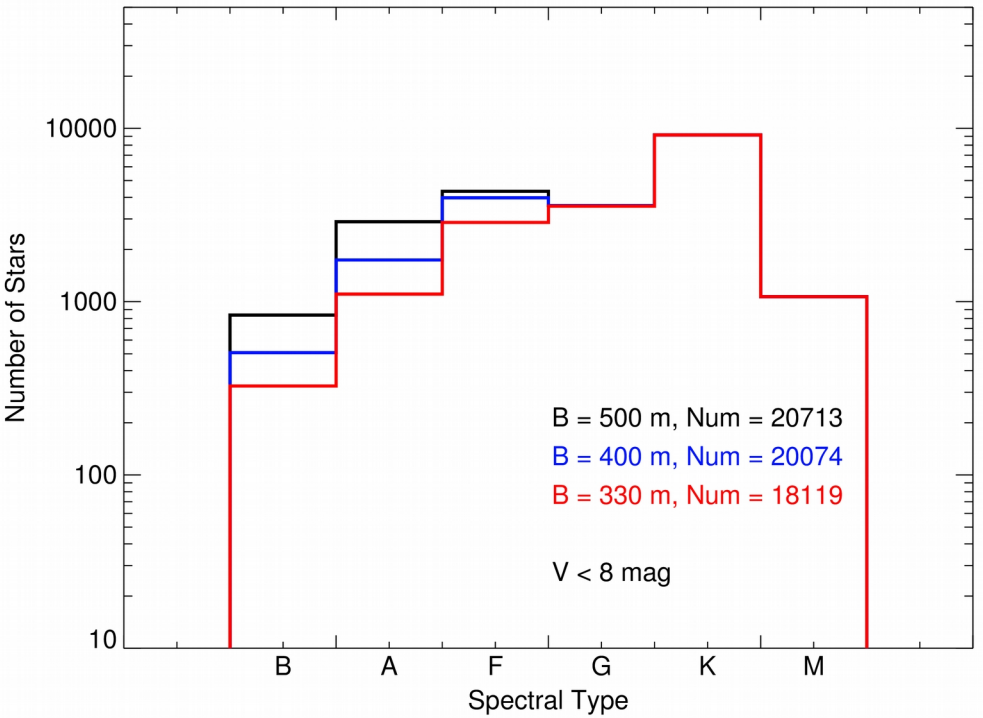
How many stars resolved: Increase maximum baseline



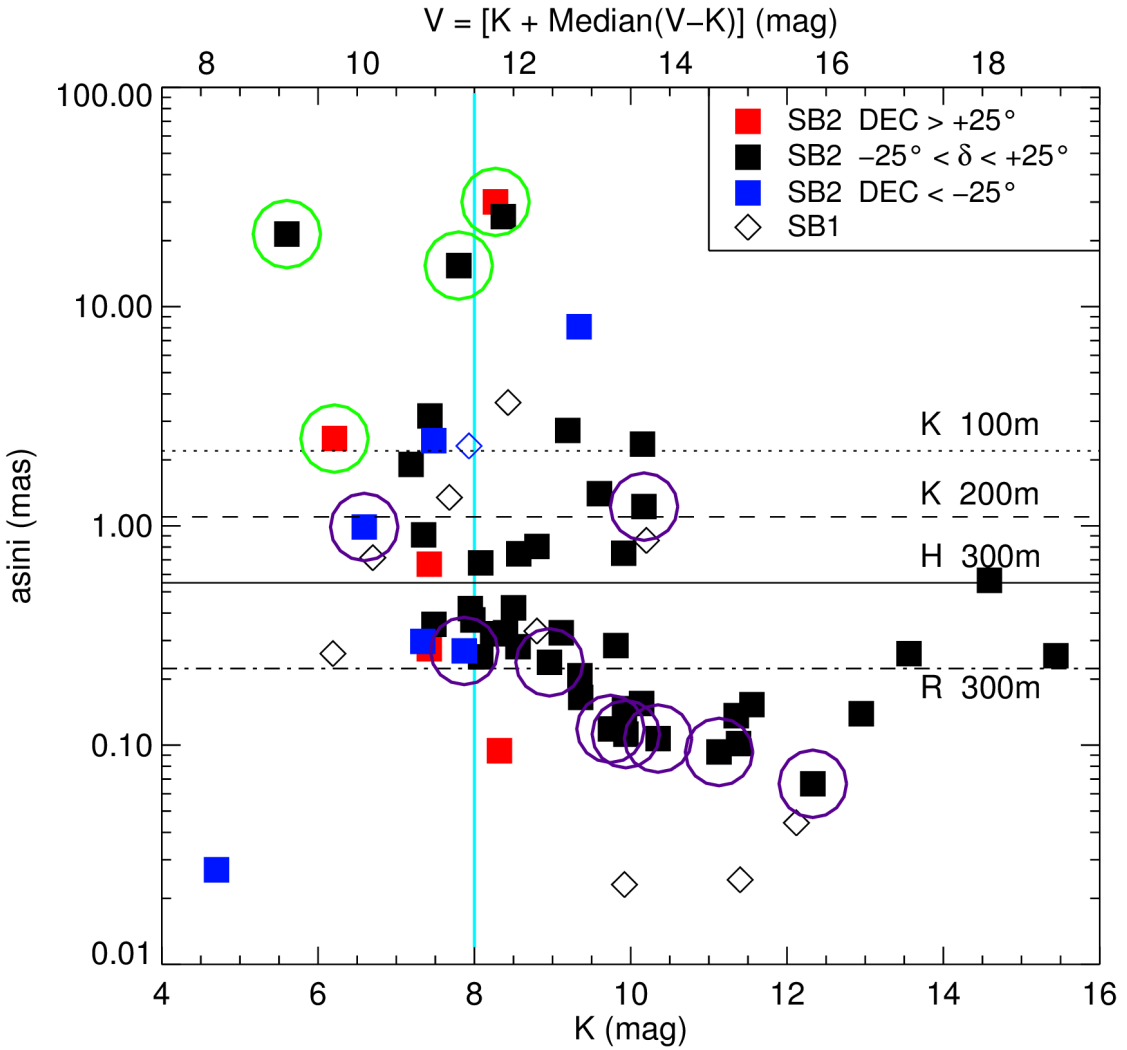
Difficult Imaging Targets:

N = 6334

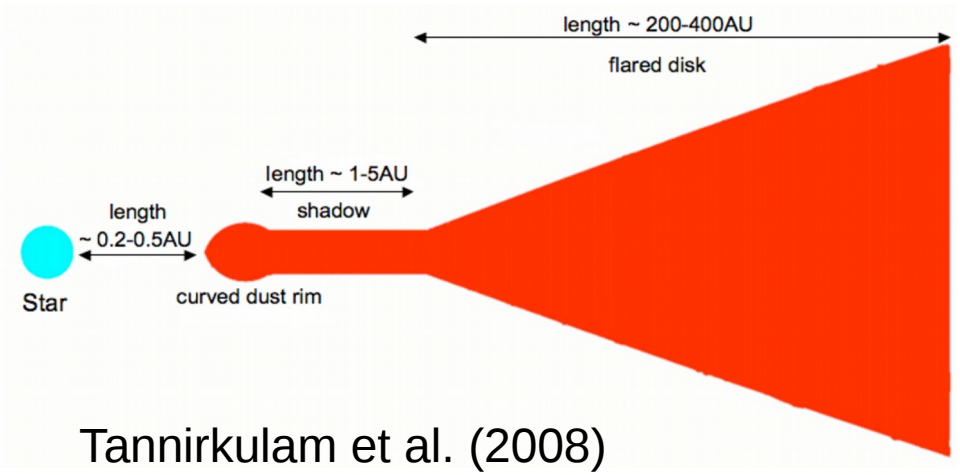

B = 500 m, Num = 36167
B = 400 m, Num = 25757
B = 330 m, Num = 19023
K < 8 mag
Number of Stars
10000
1000
100
10
B
A
F
G
K
M
Spectral Type


B = 500 m, Num = 20713
B = 400 m, Num = 20074
B = 330 m, Num = 18119
V < 8 mag
Number of Stars
10000
1000
100
10
B
A
F
G
K
M
Spectral Type

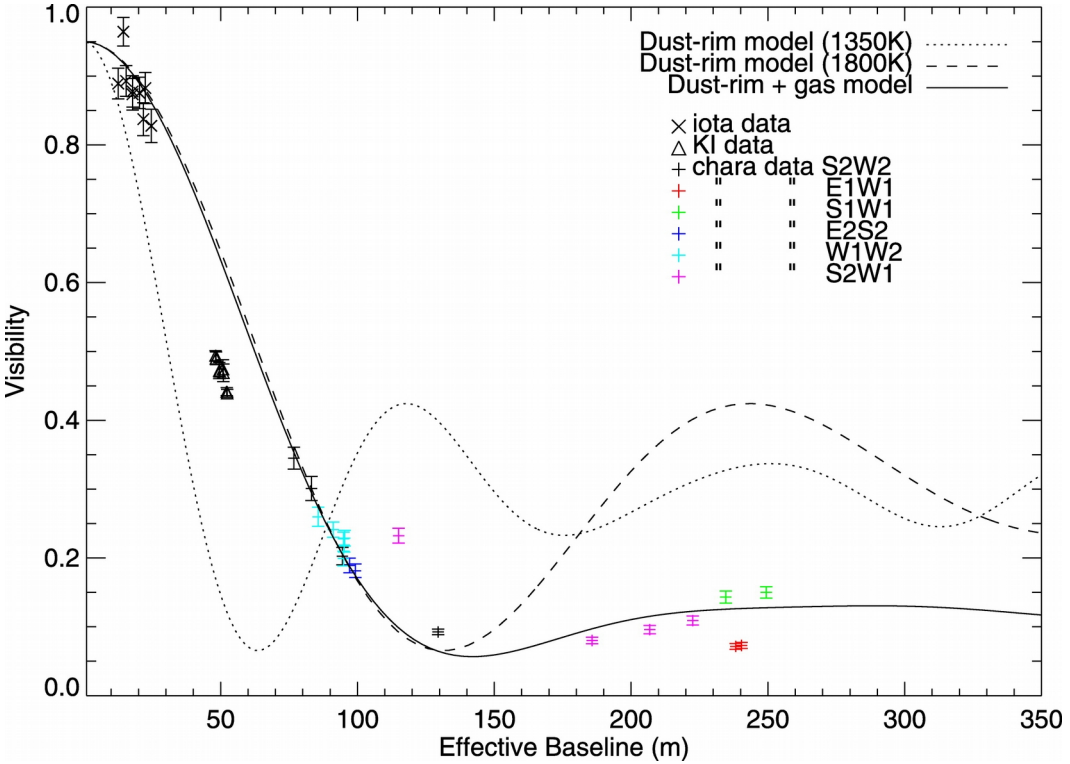
Pre-Main Sequence Spectroscopic Binaries



Young Stellar Objects with Disks



Tannirkulam et al. (2008)



Angular size of inner region: 3-8 mas

Young Stellar Objects with Disks