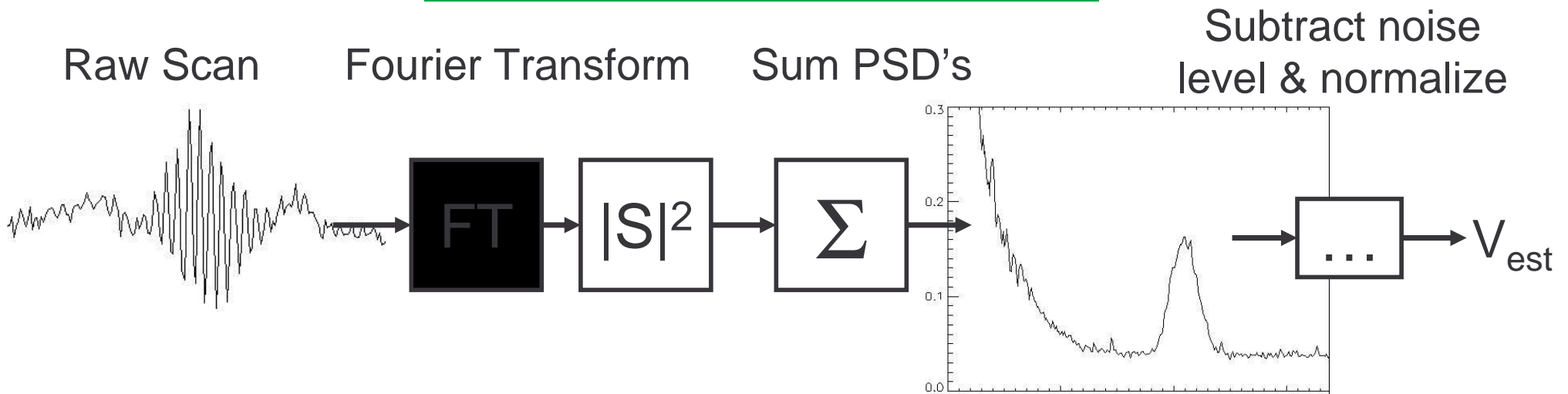


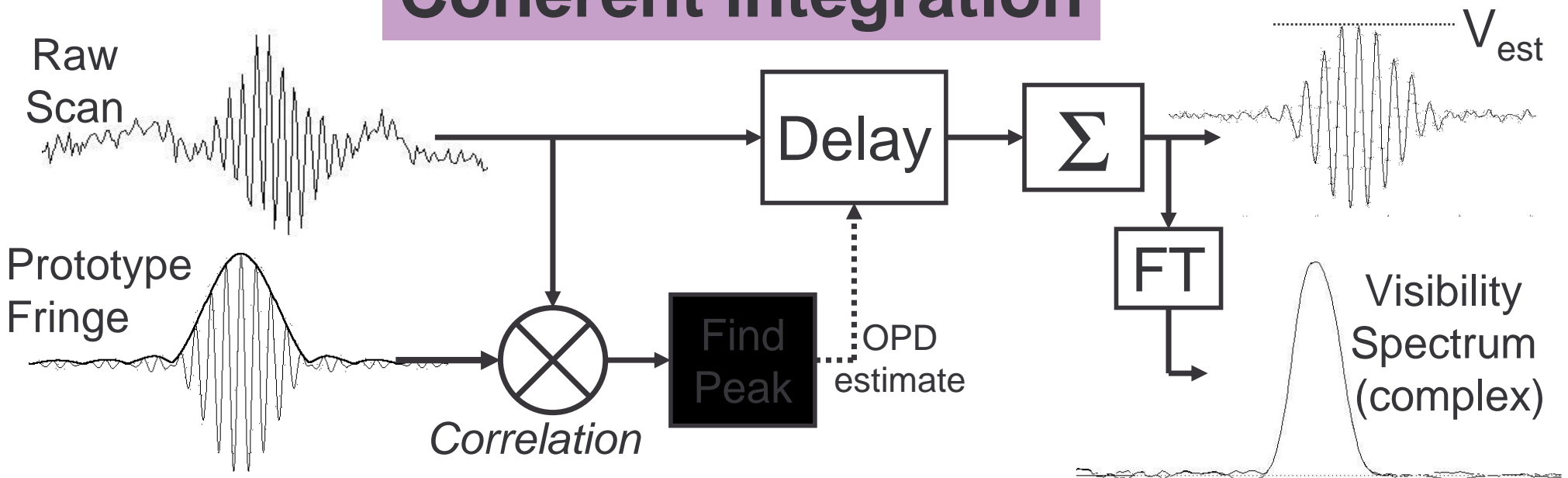
- Coherent Integration Methods;
- Visibility Phase Calibration;
- Diameter determination from raw Visibility Amplitudes using “self-calibration” and the grand cross-calibration approach
- Status of the VINCI global cross-calibration program

Jeff Meisner
Leiden Observatory

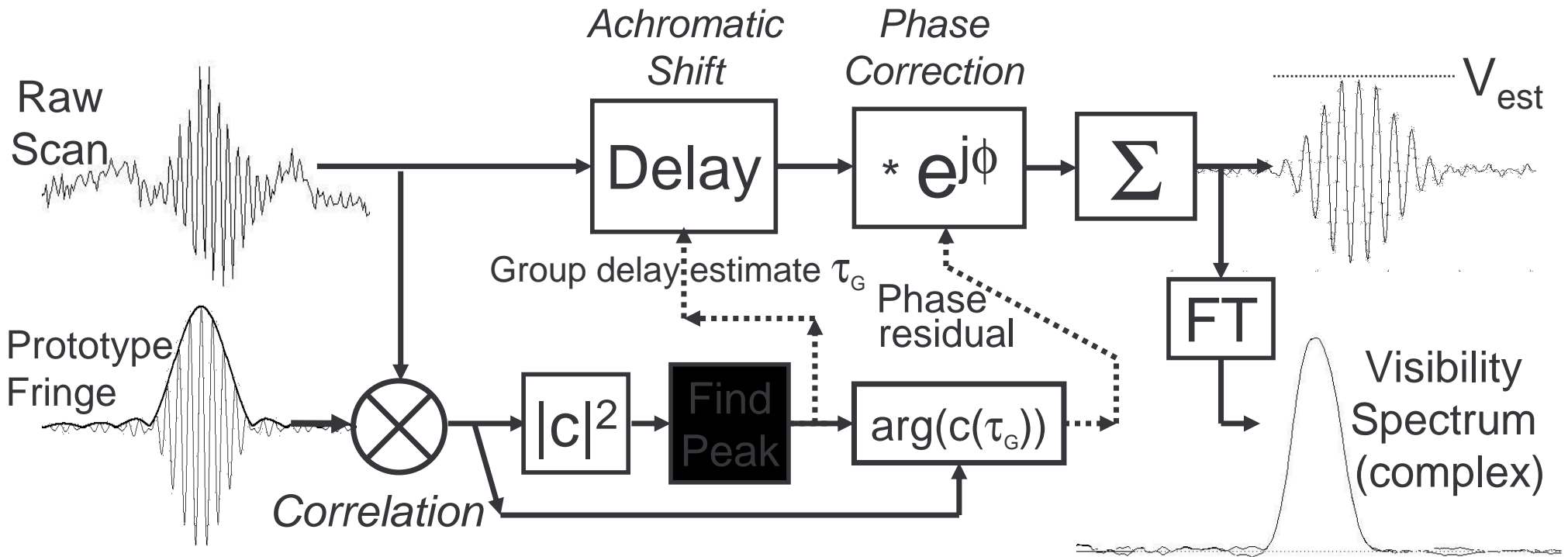
Incoherent integration



Coherent integration



“Quasi-coherent” integration



Calibrating out instrumental dispersion (including air paths) for detection of true source phase

Method:

Excess air path = D

Air dispersion = $d\phi_A/dl$

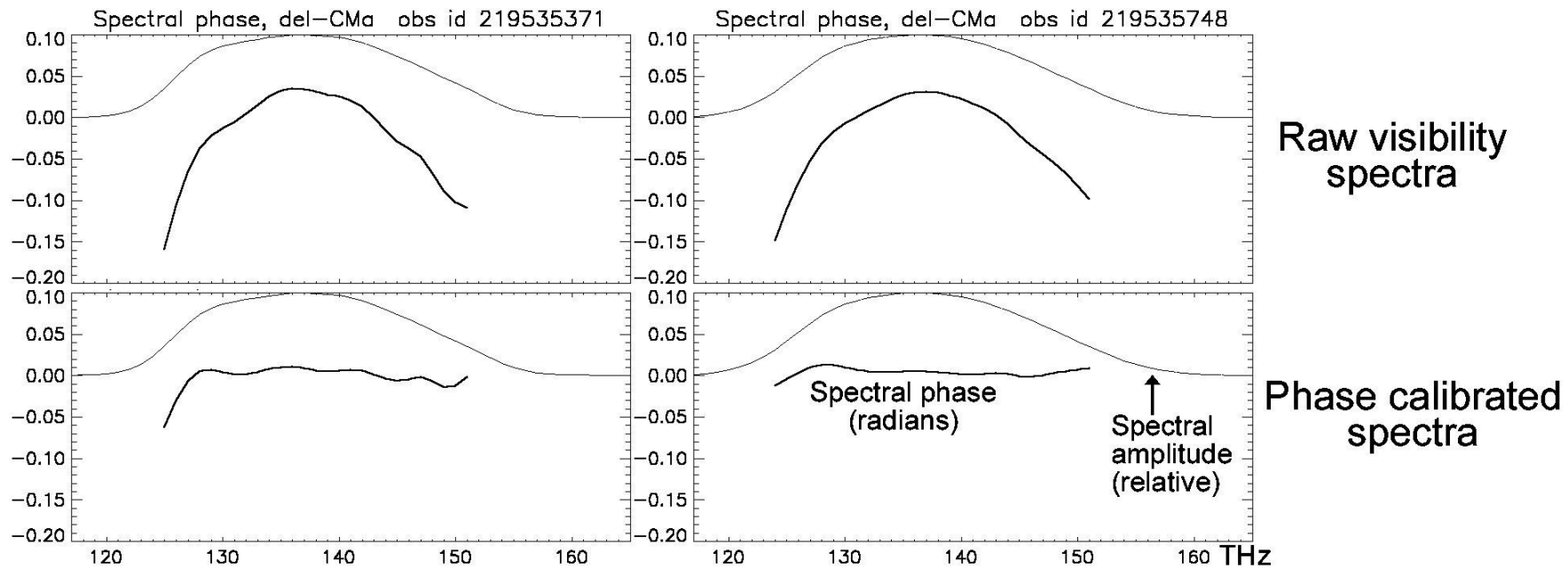
Beamcombiner phase = ϕ_B

Measured phase of visibility = ϕ_{RAW}

Then the *corrected* phase for an observation is found as:

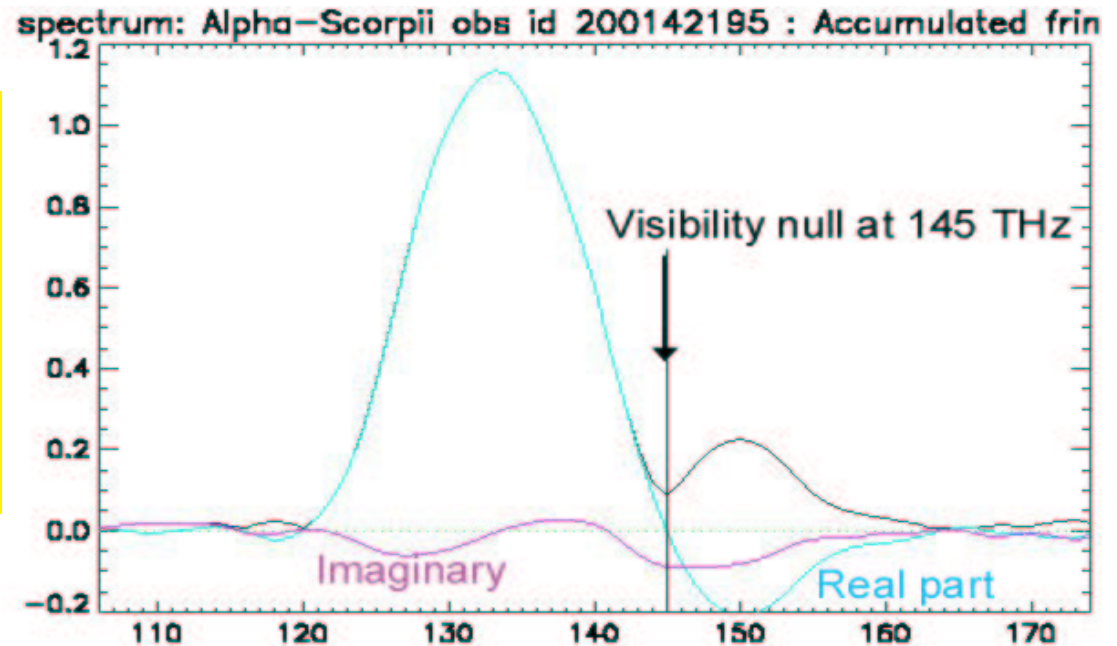
$$\phi_{\text{CORR}} = \phi_{\text{RAW}} - \phi_B - (d\phi_A/dl) D$$

Detection of extrasolar planets & dim companions by “Differential Phase” requires an accuracy of about .001 radian – yet 10 times better than achieved here. (but 50 times better than the uncorrected spectra, at top!)

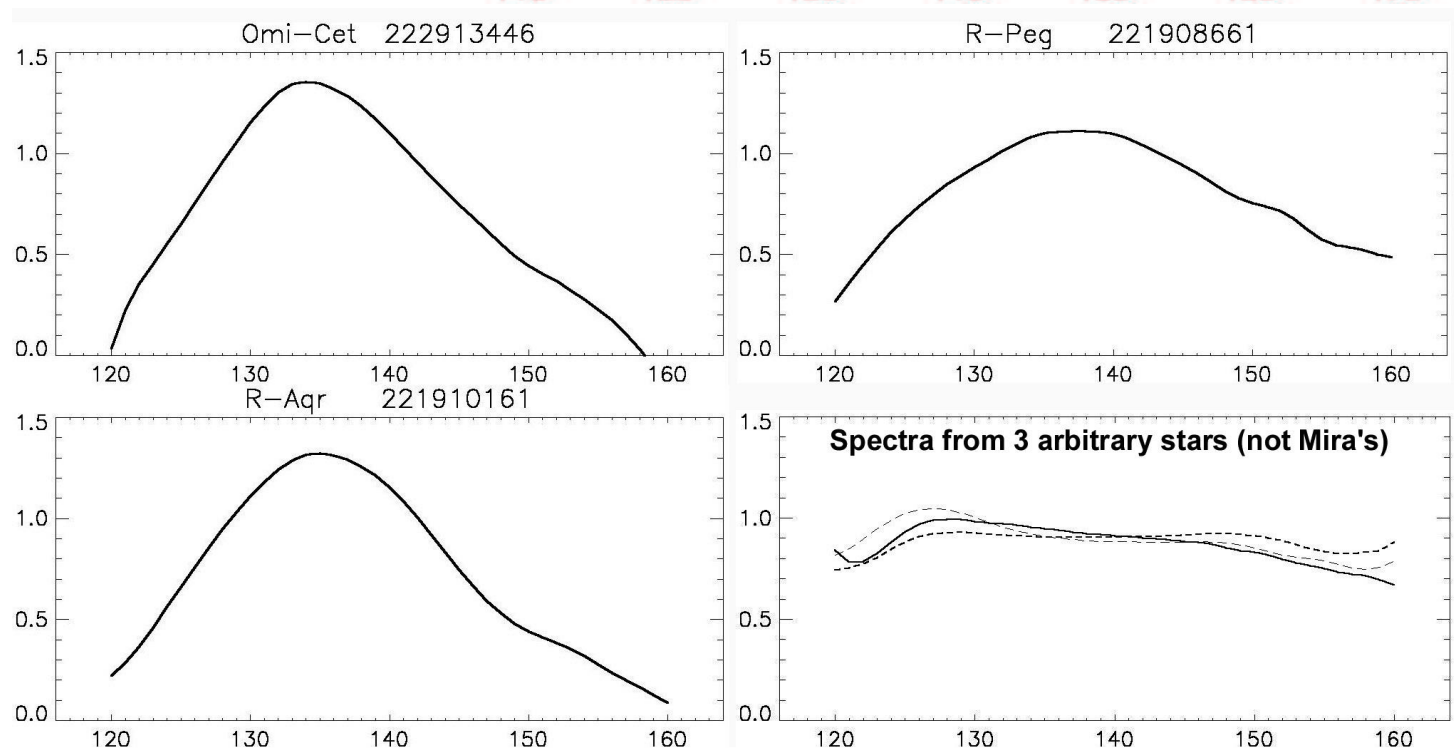


Results obtained from coherently integrated visibility spectra

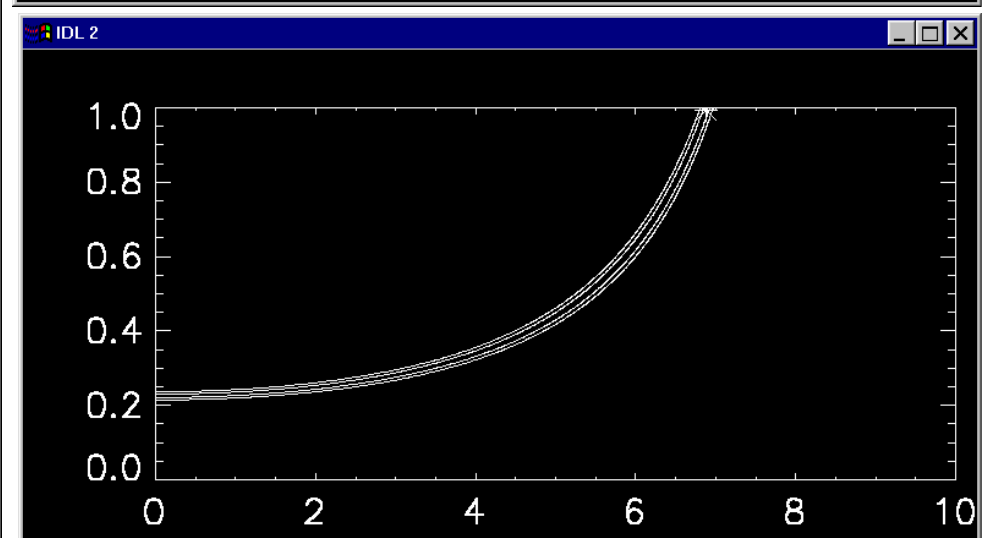
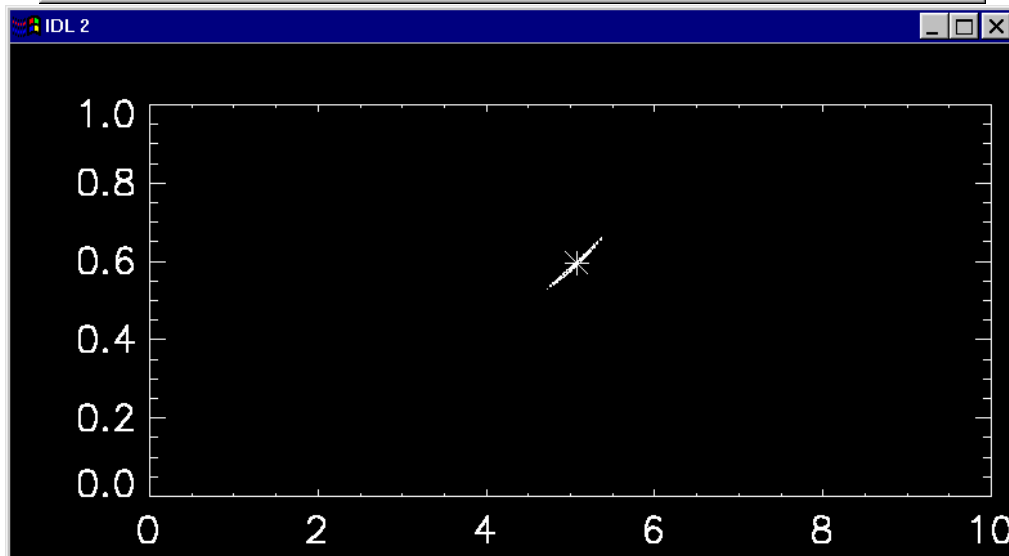
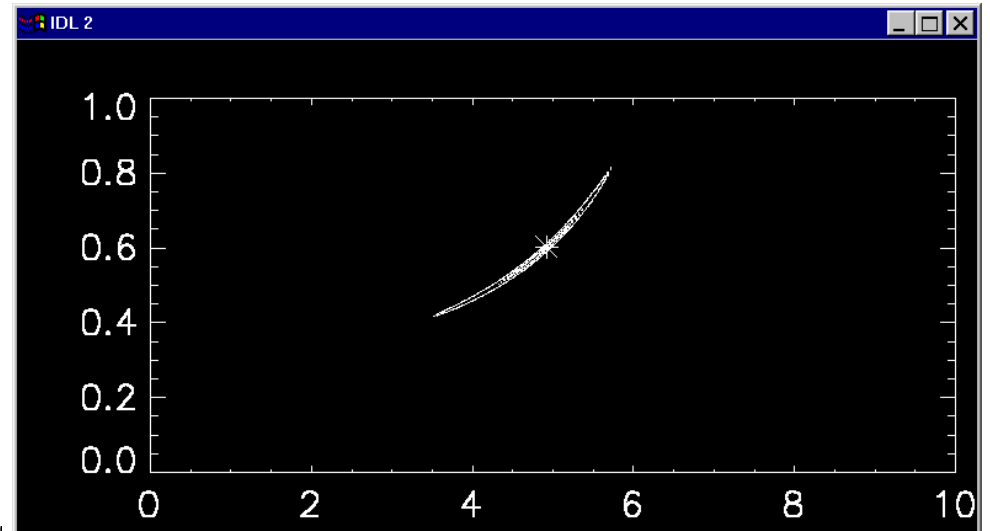
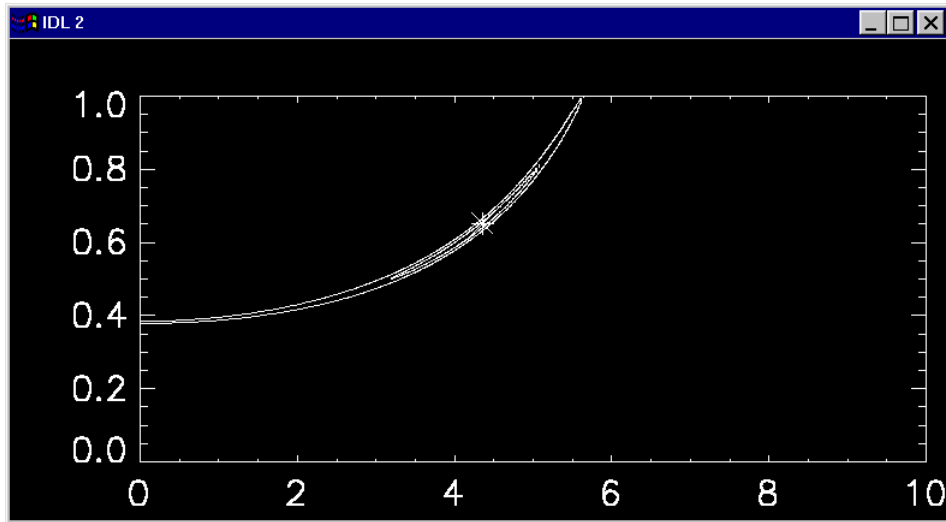
Measurement of stellar diameters by observing the null in the coherently integrated visibility spectrum



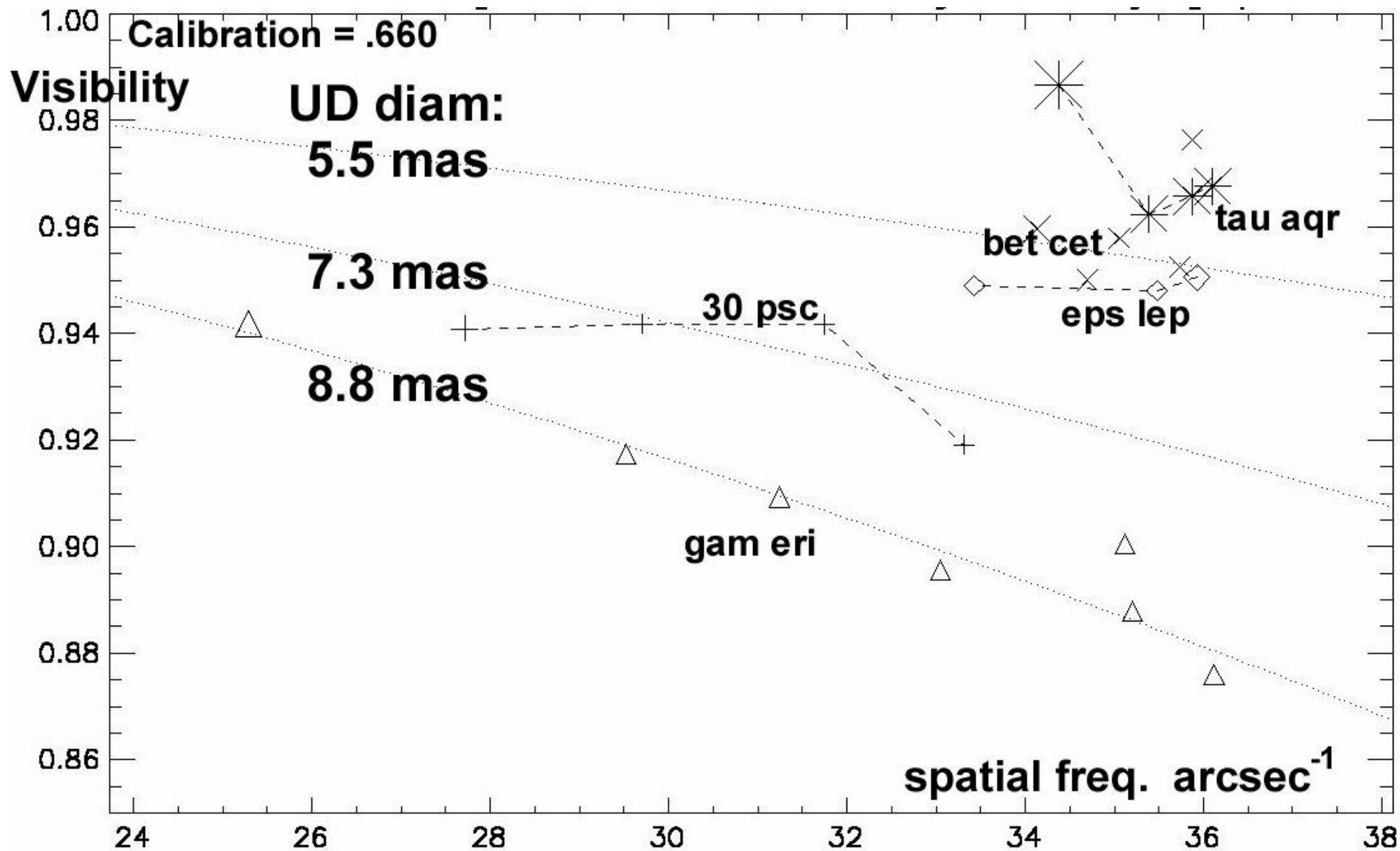
Unusual correlated spectra of many Mira variables



Error “ellipses” with self-calibration of observations from one object during one night, assuming a stable transfer function

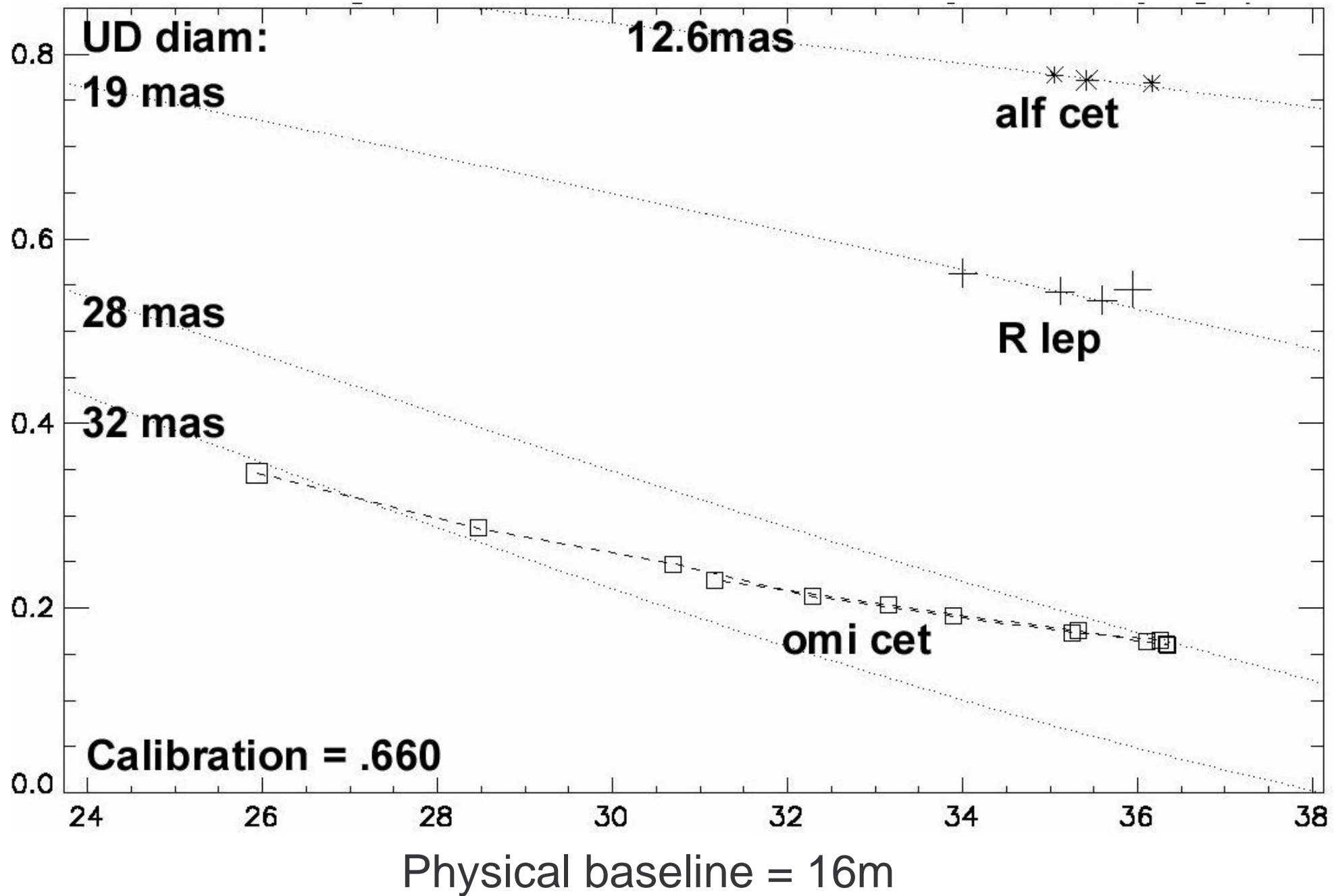


JD2205 VINCI visibilities using calibration = .660

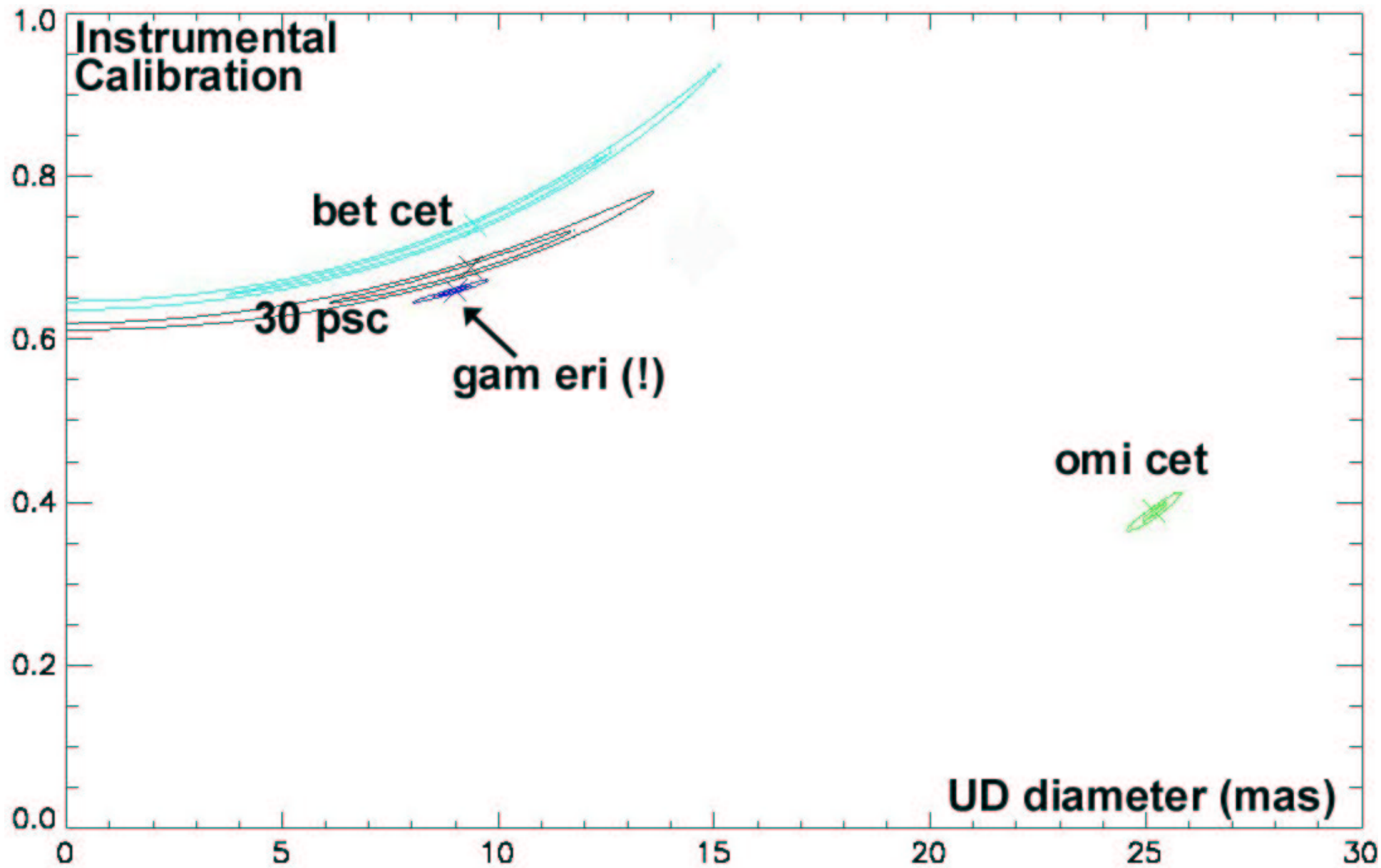


Physical baseline = 16m

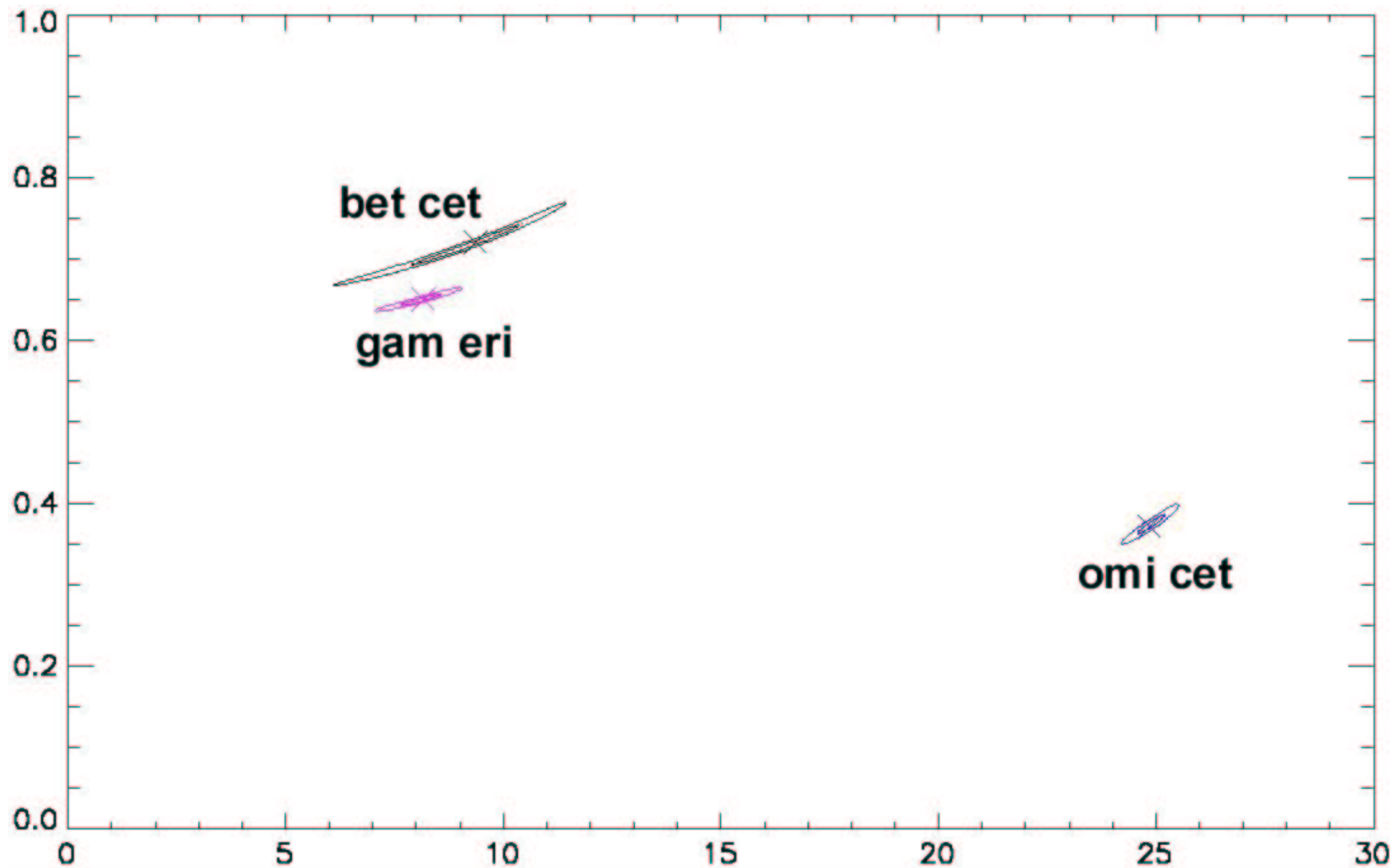
JD2205 VINCI visibilities using calibration = .660



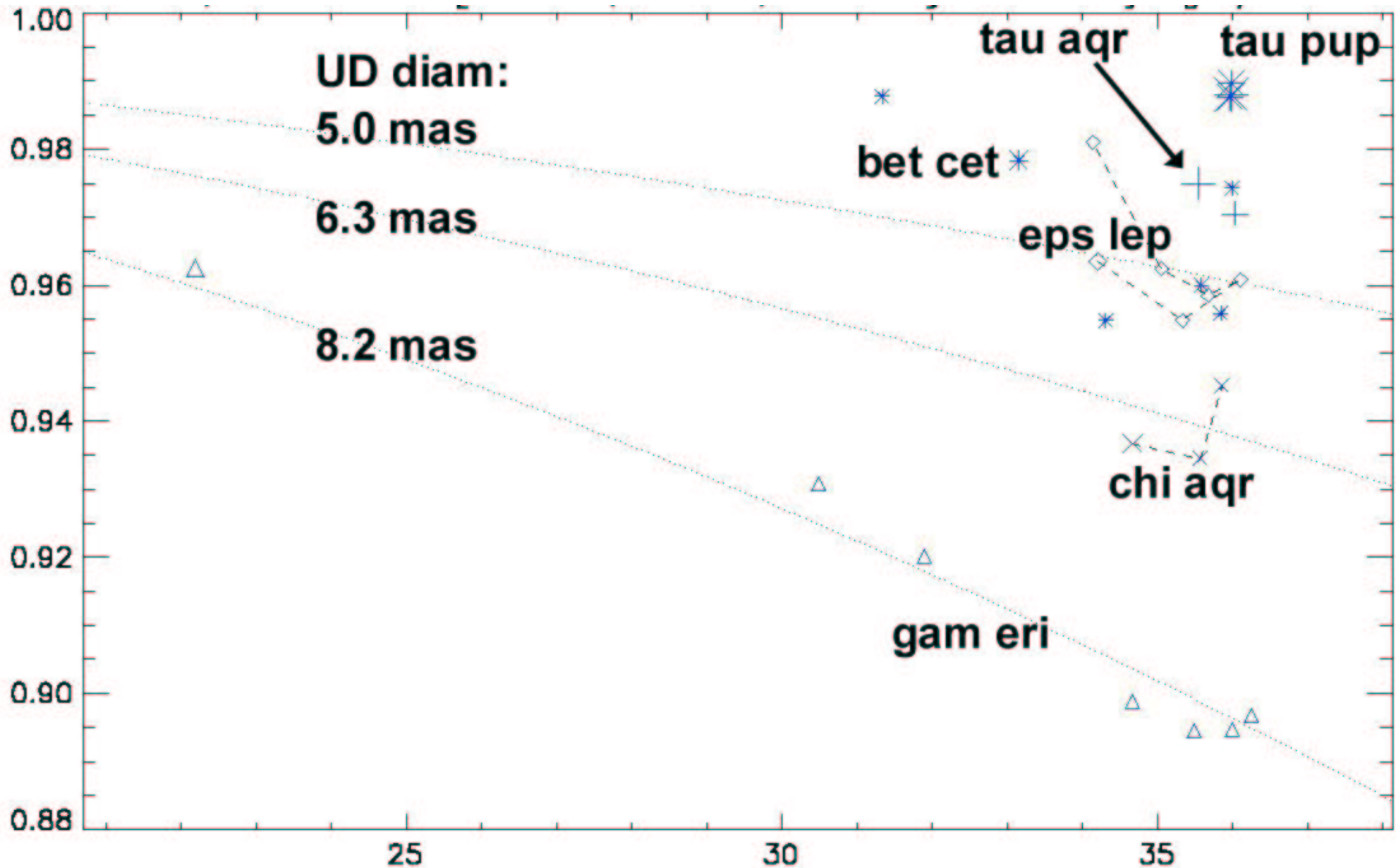
Error “ellipses” with self-calibration of observations from each object during one night – JD 2205 , assuming a stable transfer function



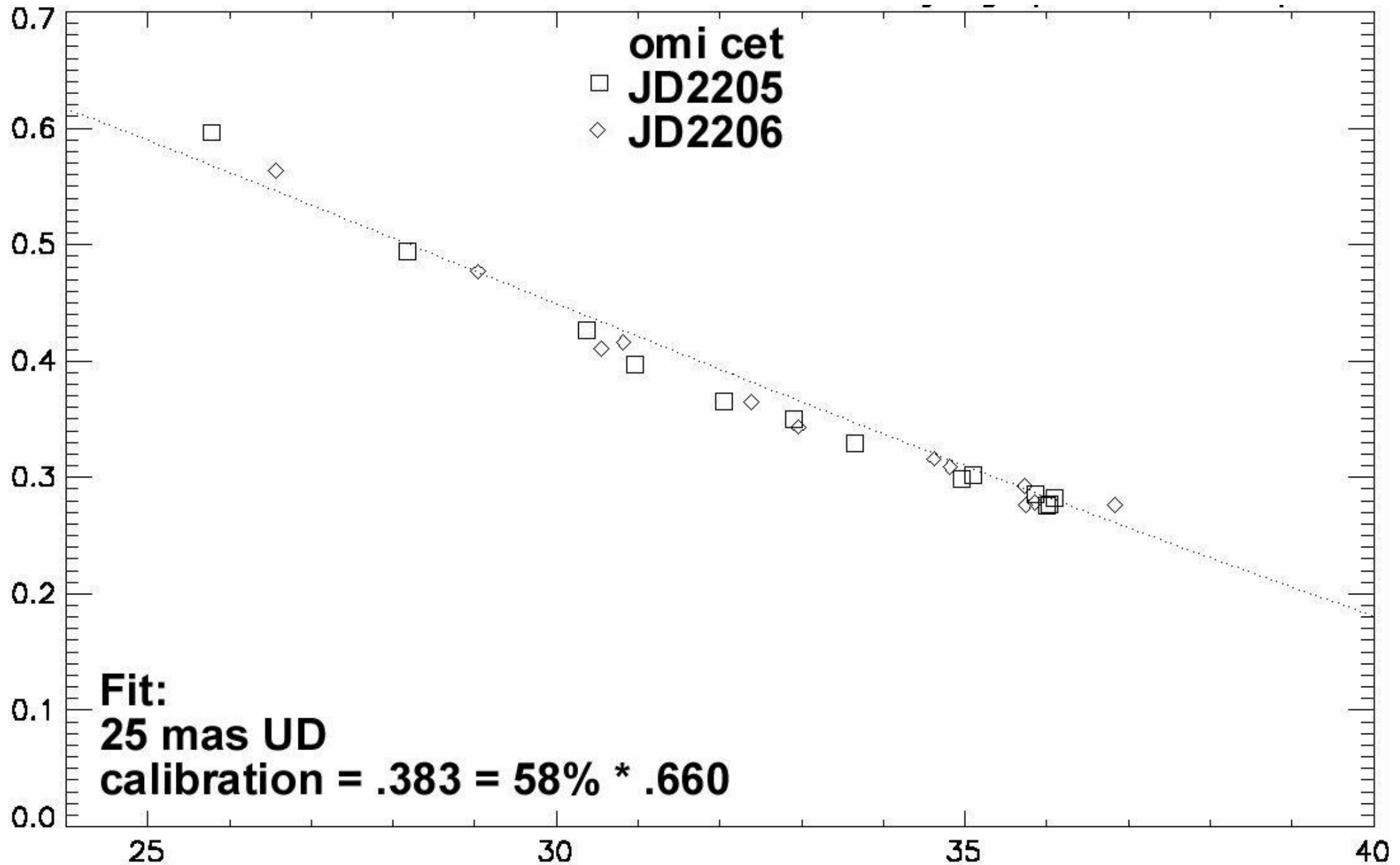
Error “ellipses” with self-calibration of observations from each object during one night – JD 2206 , assuming a stable transfer function



JD2206 VINCI visibilities using calibration = .660



Fit of omi cet visibilities from JD2205-2206, assuming correlatable power = 58% of flux, Diameter = 25 mas (UD)



The End