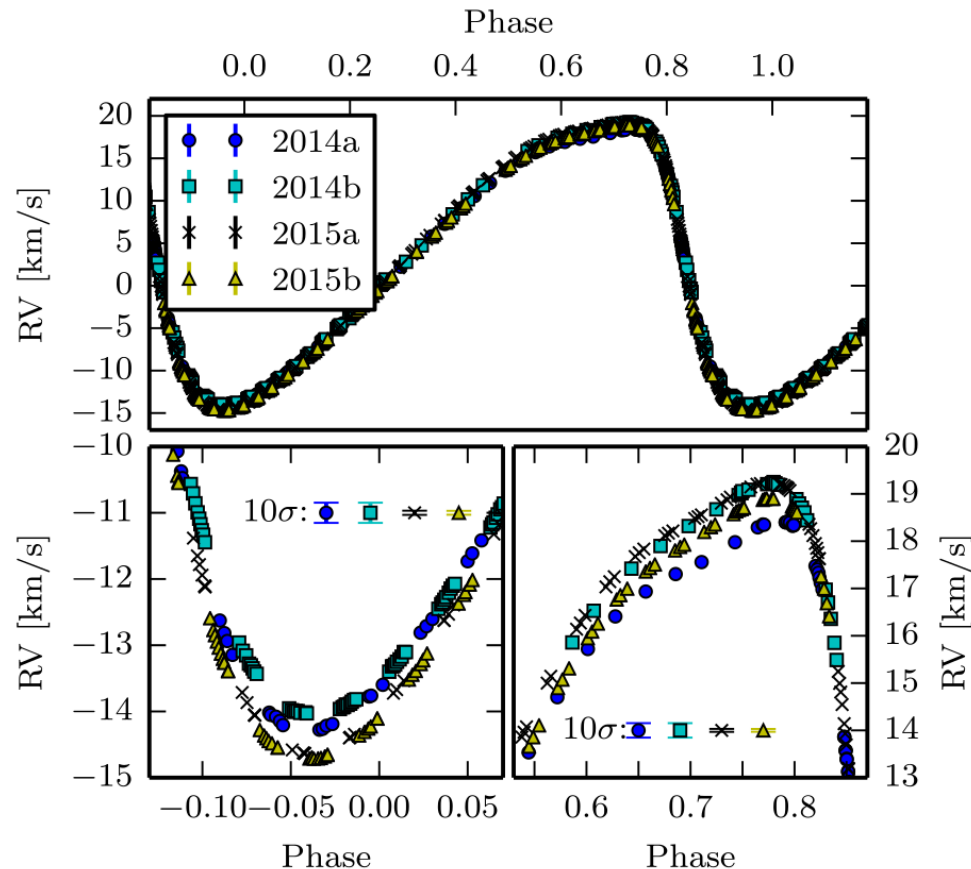


Investigating **cycle-to-cycle variations** in the long-period Cepheid ℓ Carinae using VLT/PIONIER and EULER/CORALIE

Richard I. Anderson, A. Mérand, P. Kervella, J. Breitsfelder, L. Eyer, A. Gallenne, N. Mowlavi

[Anderson et al. \(2016\), MNRAS 455, 4231; arXiv: 1511.07089](#)

Anderson (2014): RV cycle-to-cycle variations



Linear radius variation:

$$\Delta R = p \int RV$$

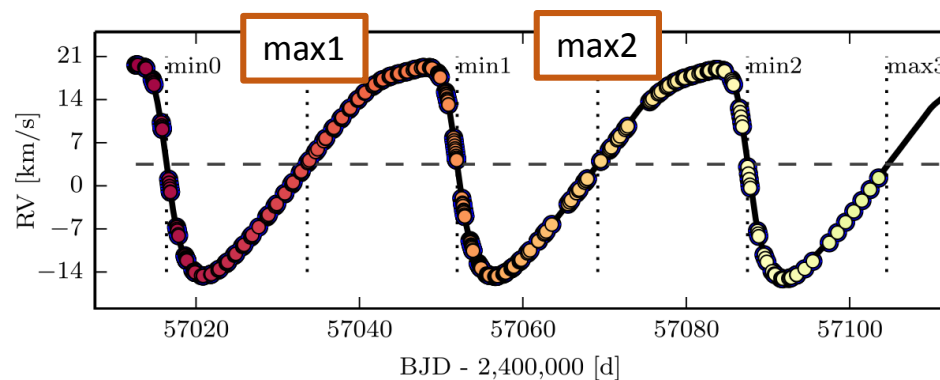
Baade-Wesselink distance:

$$d \propto \Delta R / \Delta \Theta$$

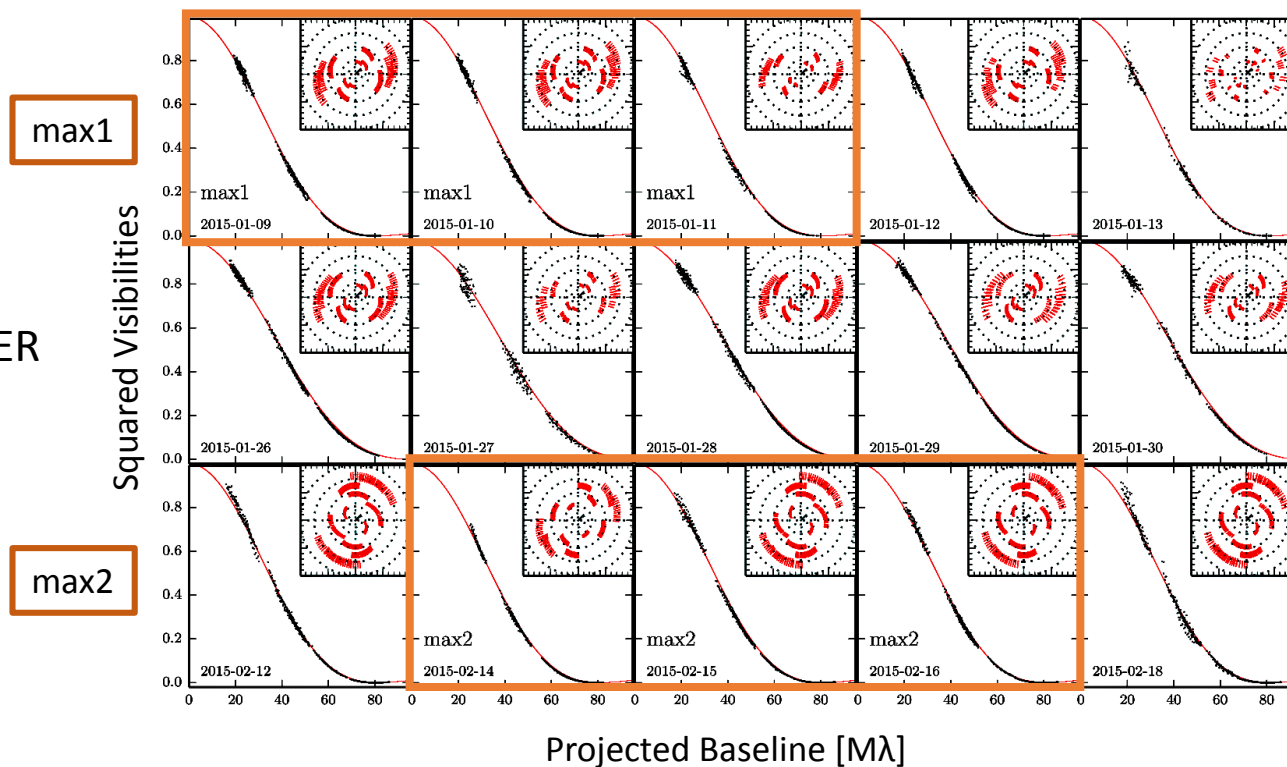
Does $\Delta \Theta$ exhibit
cycle-to-cycle changes?

360 CORALIE observations contemporaneous with 15 half-nights of PIONIER

CORALIE

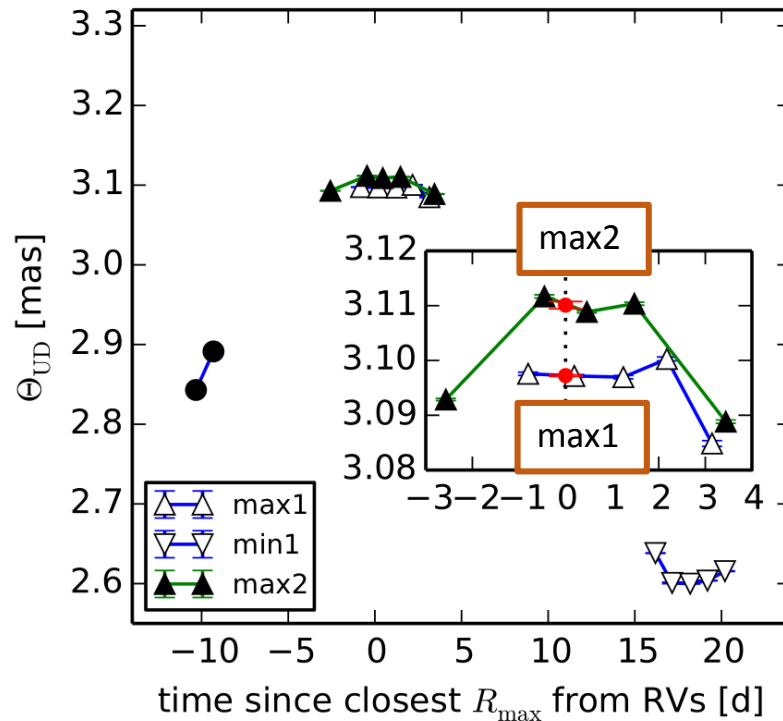


PIONIER



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RVs indicate:

R_{max} *decreased*

Diameters indicate:

Θ_{max} *increased*

Optical (VLT) and *gas* (CORALIE) layers differently affected by cycle-to-cycle variations

Complex cycle-to-cycle variations not understood. They introduce systematic uncertainty for Baade-Wesselink distances, e.g. as projection factors.