

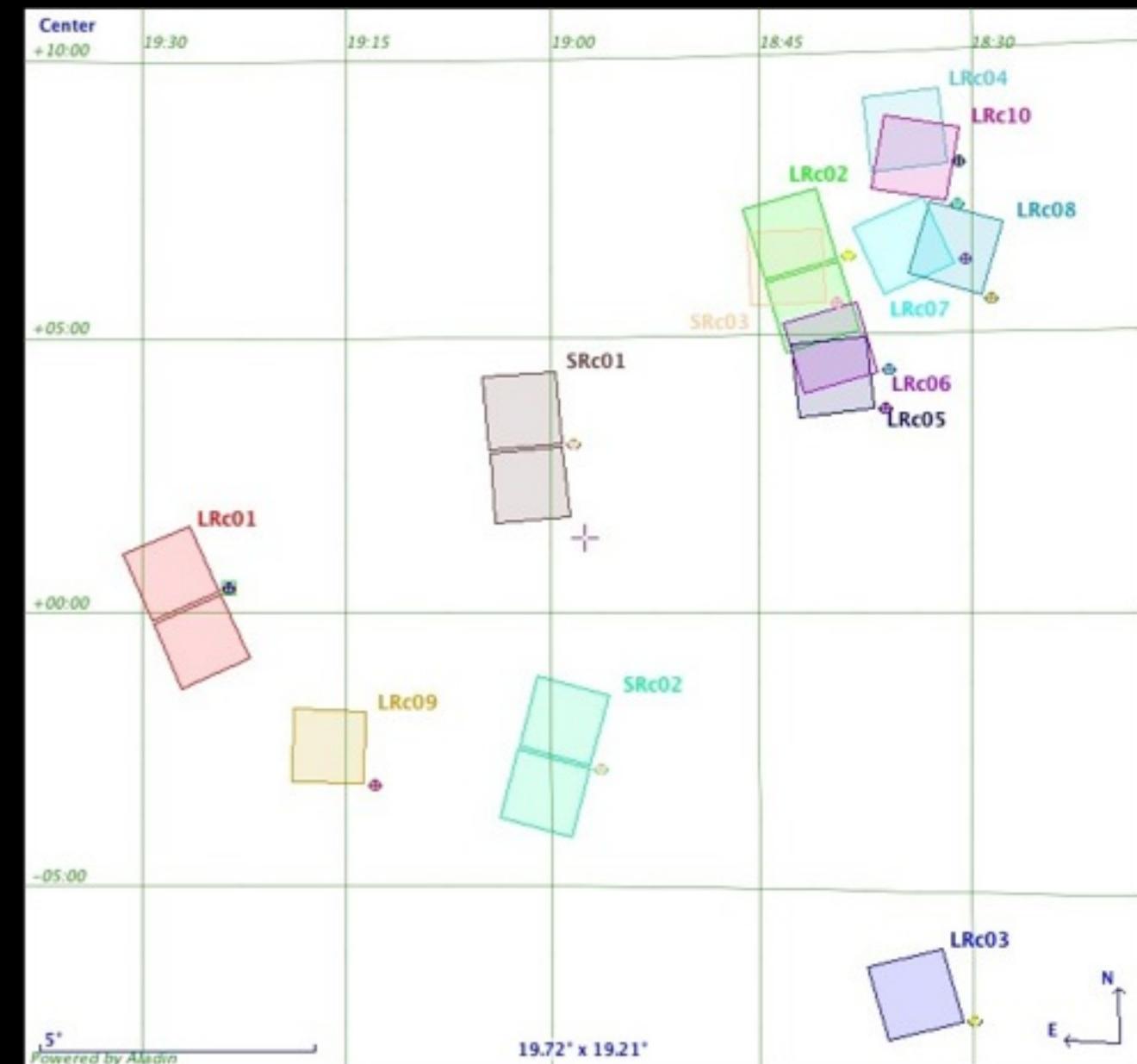
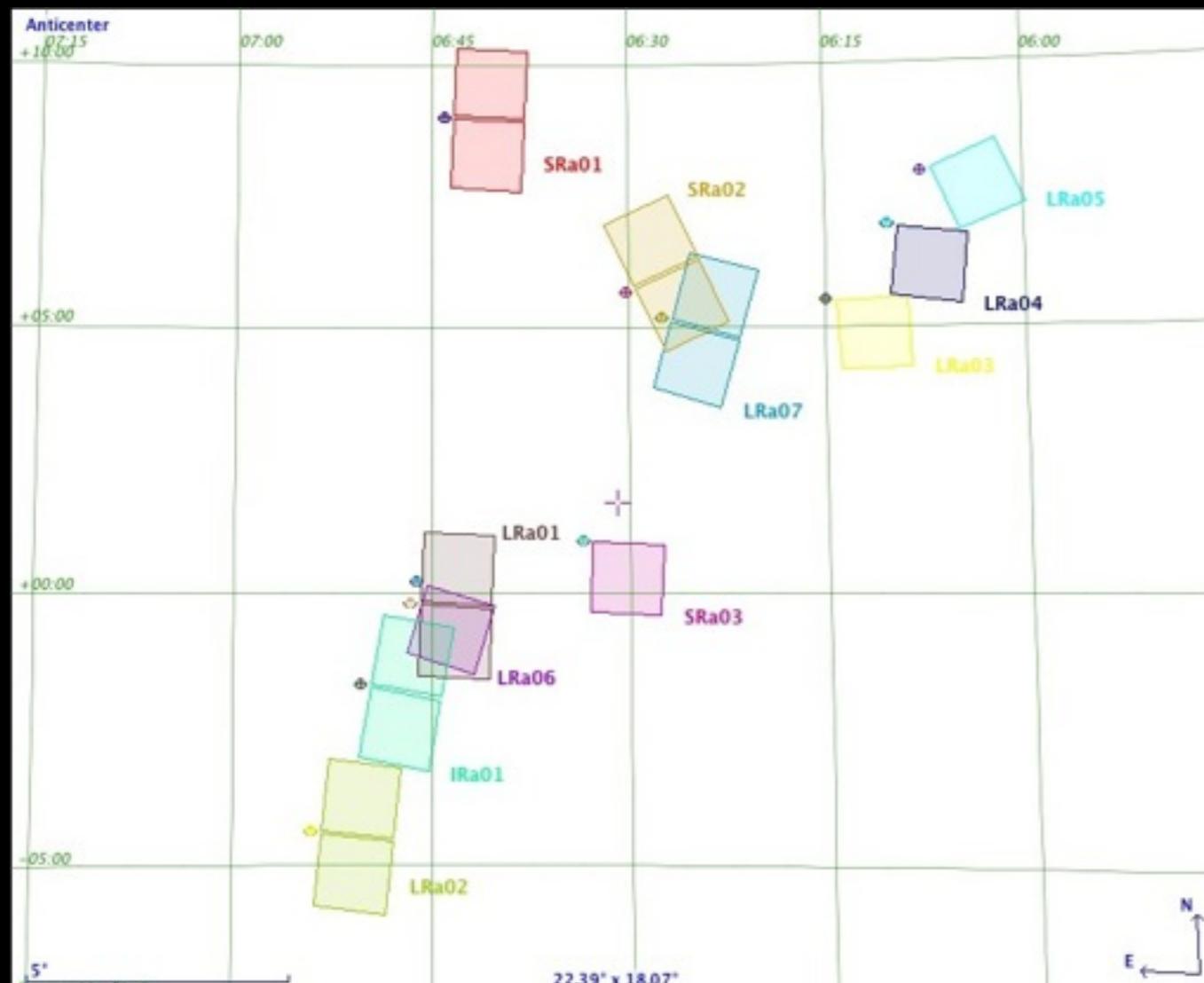
Le programme exoplanètes de CoRoT: comment ça marche?

M. Deleuil pour le CoRoT Exoplanet Science Team
Laboratoire d'Astrophysique de Marseille

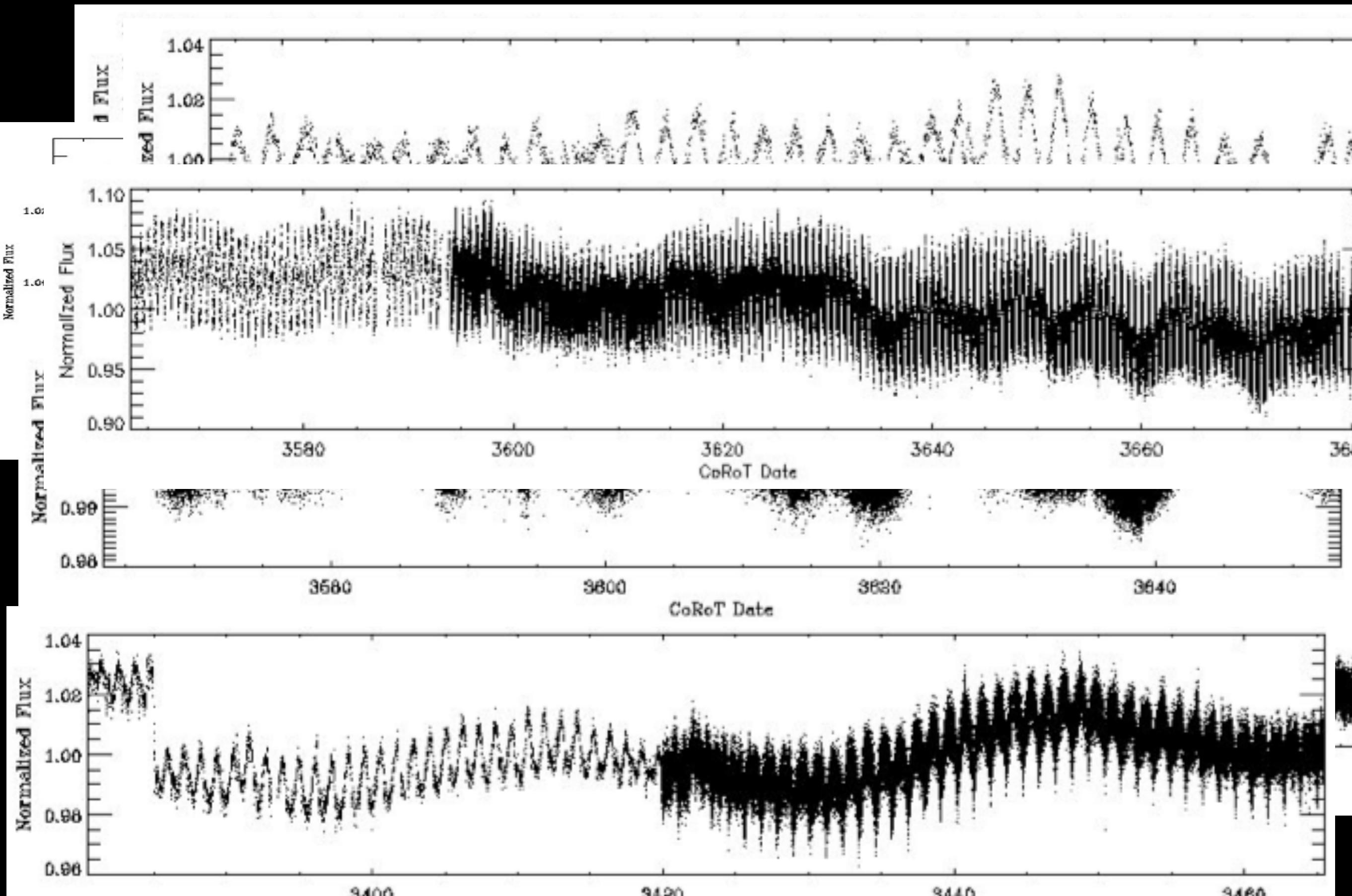
Les champs exoplanètes

26 runs :

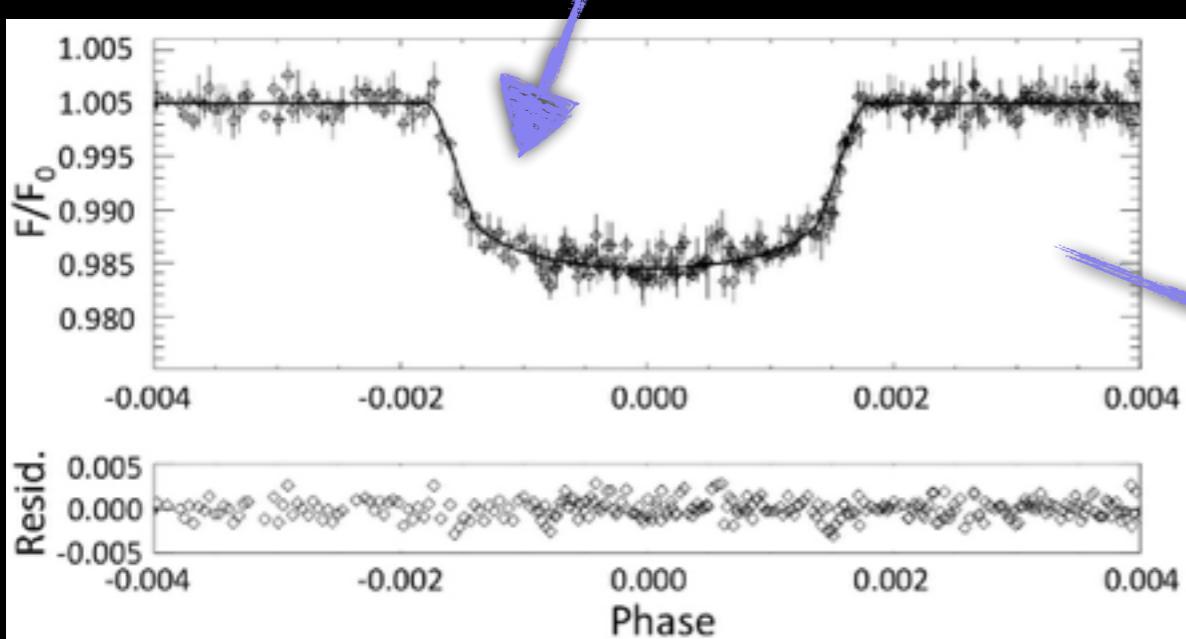
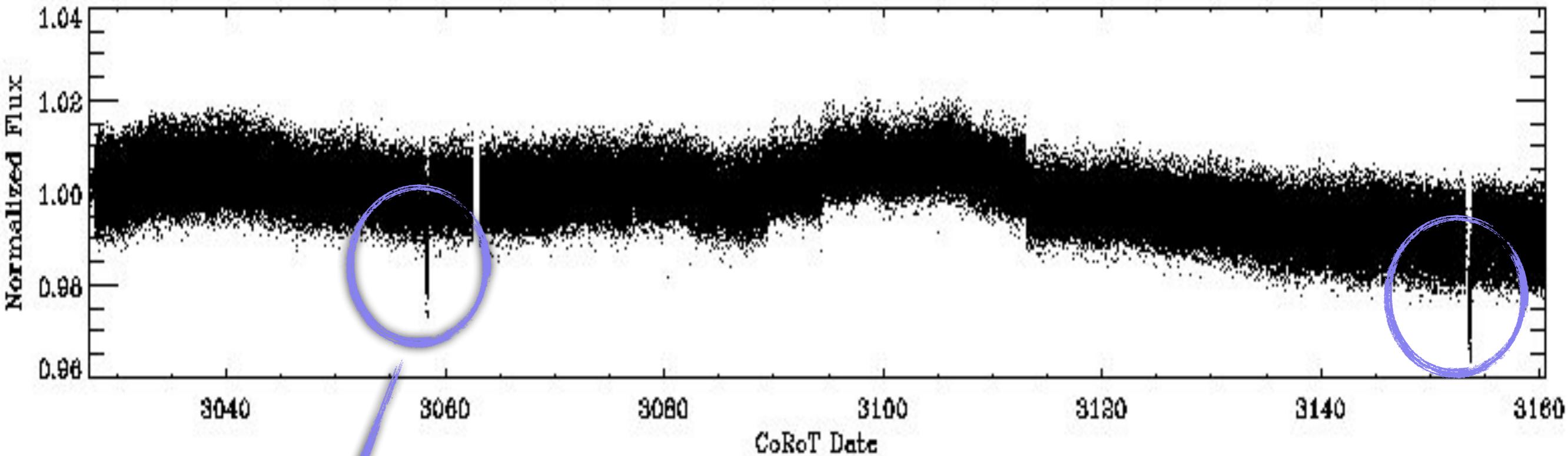
~ 169 967 courbes de lumière (LC)
durée d'observation entre 21 jours (SRc02) et 152 jours (LRc01)
souplesse de la stratégie d'observation



Le côté “exo” de CoRoT



Courbe de lumière - transits - planète



Transiting exoplanets from the CoRoT space mission*

XXIV. CoRoT-24: validating a transiting multi-planet system.

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(Affiliations can be found after the references)

Received ...; accepted ...

ABSTRACT

We present the discovery of a candidate multiply-transiting system, the first one found in the CoRoT mission. Two transit-like features with periods of 5.11 and 11.76 d are detected in the CoRoT light curve, around a main sequence K1V star of $r=15.1$. If the features are due to transiting planets around the same star, these would correspond to objects of 3.7 ± 0.4 and $5.0 \pm 0.5 R_{\oplus}$ respectively. Several radial velocities serve to provide an upper limit of $36 M_{\oplus}$ for the 5.11 d signal, and to tentatively measure a mass of $40^{+16}_{-15} M_{\oplus}$ for the object transiting with a 11.76 d period. The detailed analysis of the photometric and spectroscopic data serve to estimate the probability that the observations are caused by transiting Neptune-sized planets as $>24\times$ higher than a blend scenario involving only one transiting planet, and $>1200\times$ higher than a scenario involving two blends and no planets. The radial velocities show a drift of $52^{+7}_{-5} \text{ m s}^{-1} \text{yr}^{-1}$ that might be due to additional planets in the system.

Key words. stars: planetary systems - techniques: photometry - techniques: radial velocities - techniques: spectroscopic

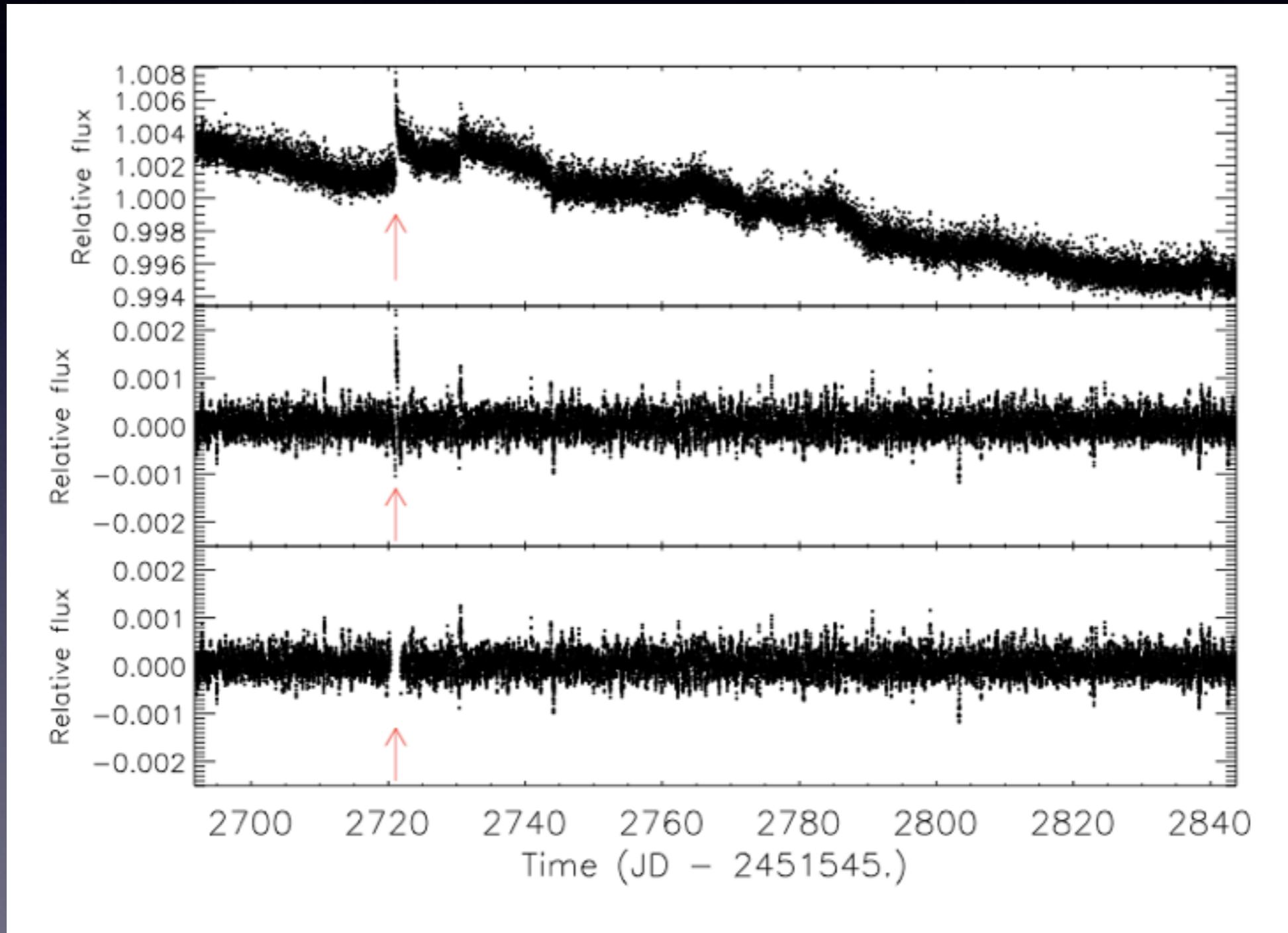
CoRoT Exoplanet Science Team (CEST)



Un travail collaboratif

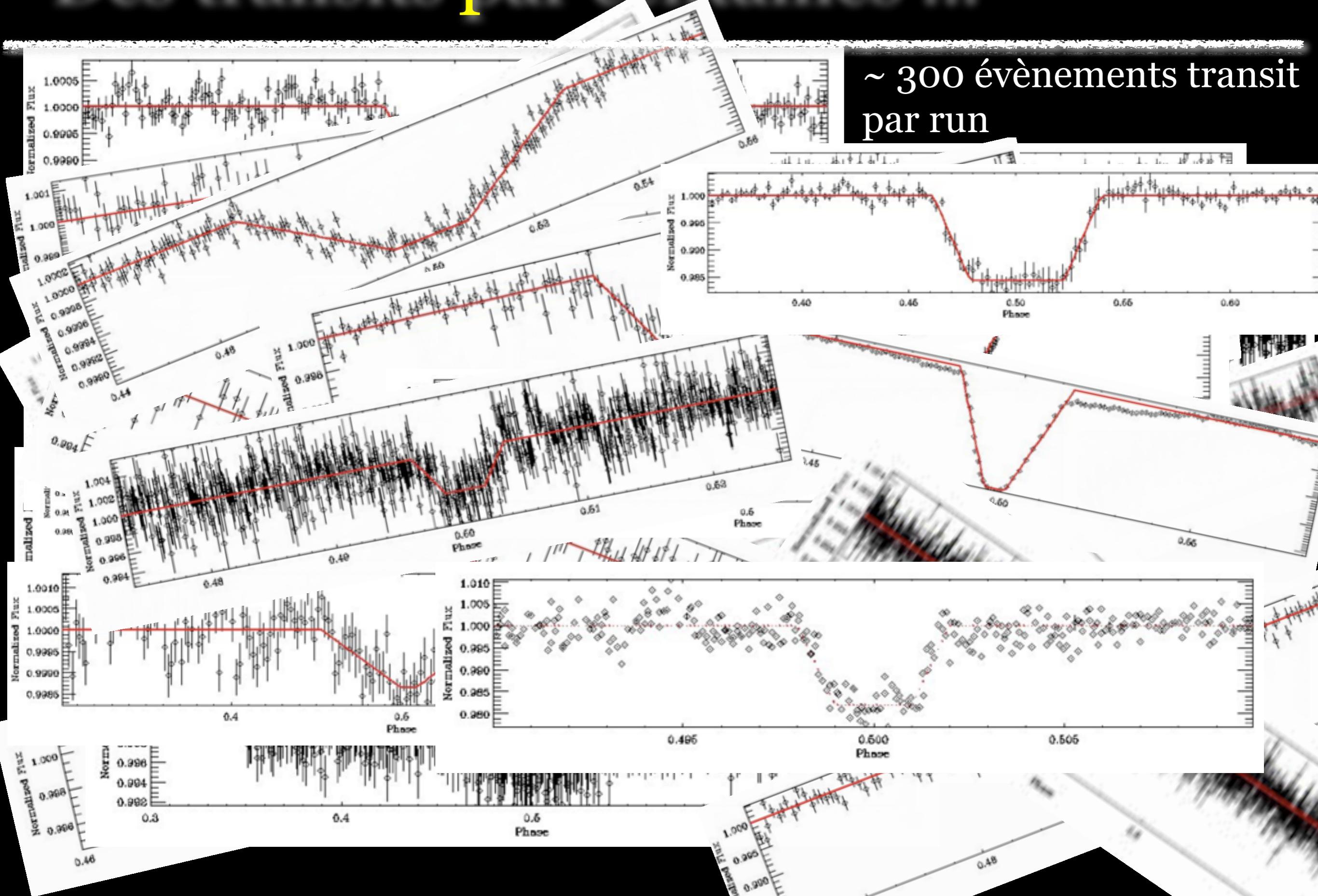
Première étape, filtrage et détection

Différentes techniques et algorithmes de détection



Des transits par centaines ...

~ 300 évènements transit
par run

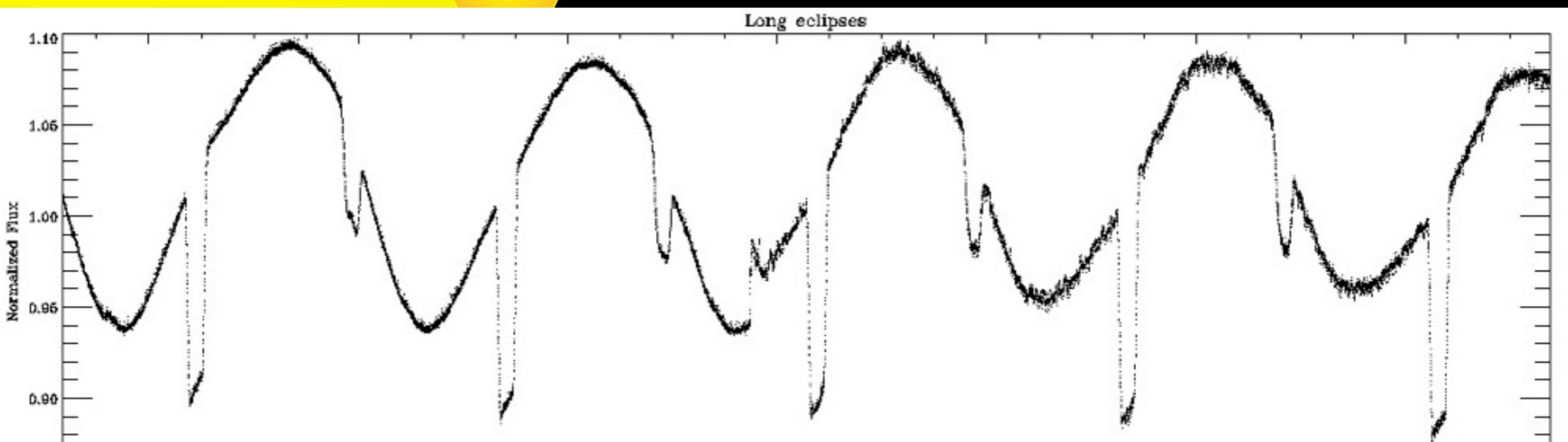
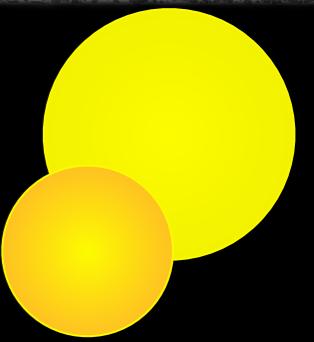


Qui est à l'origine des transits?



Binaire : compagnon
de faible masse

Binaire rasante



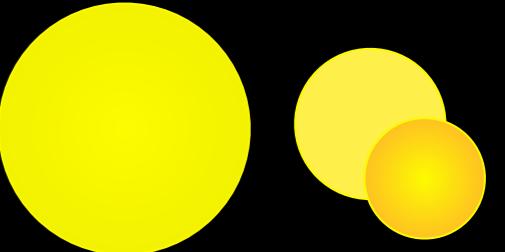
Qui est à l'origine des transits?

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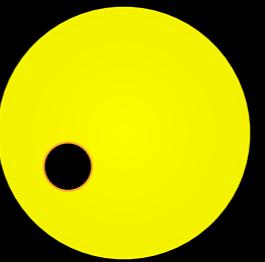


Système multiple ou
contamination

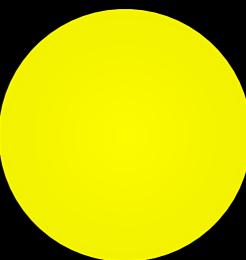
Binaire rasante



Planète!



Faux positif ..

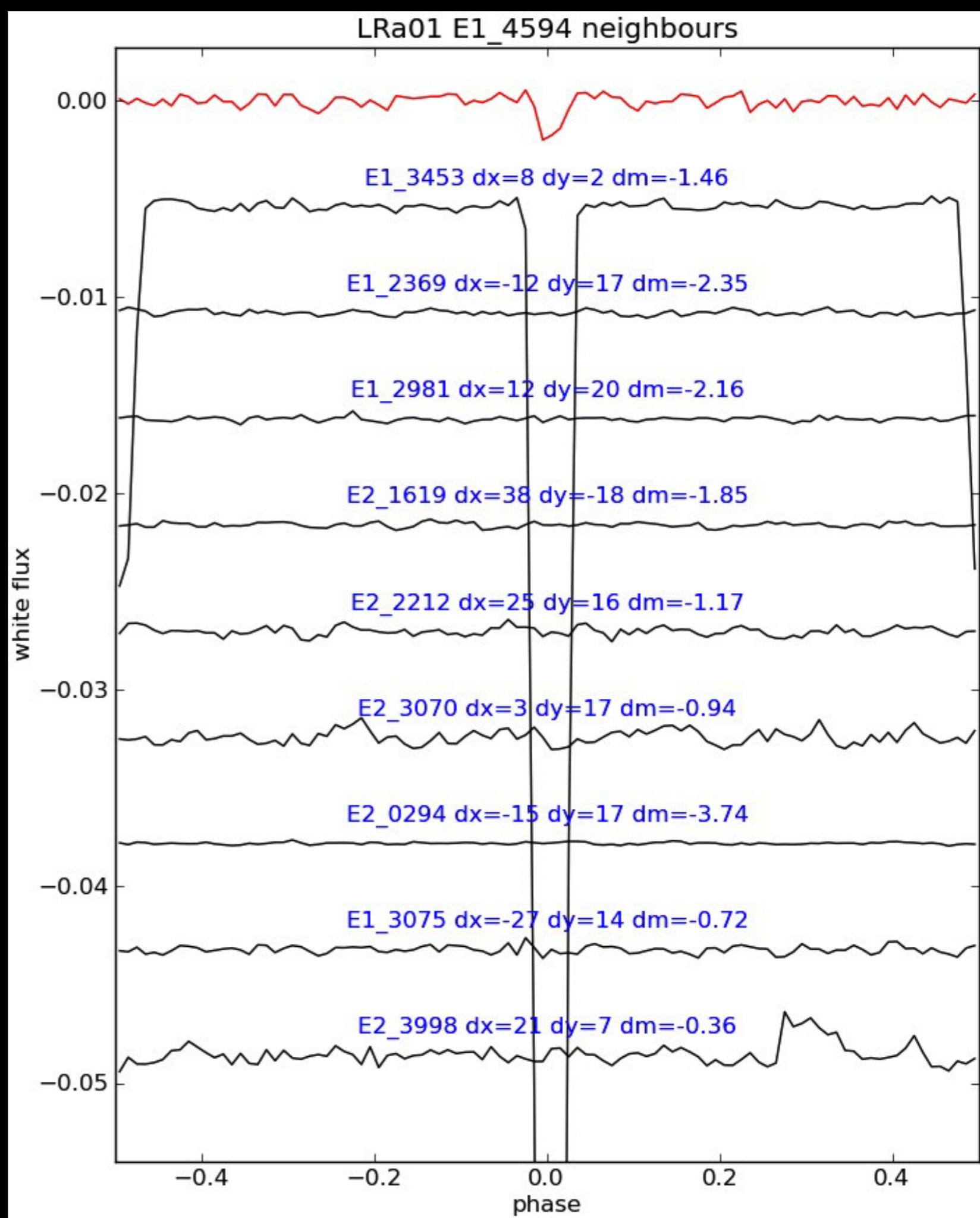


La large majorité des transits sont de nature stellaire

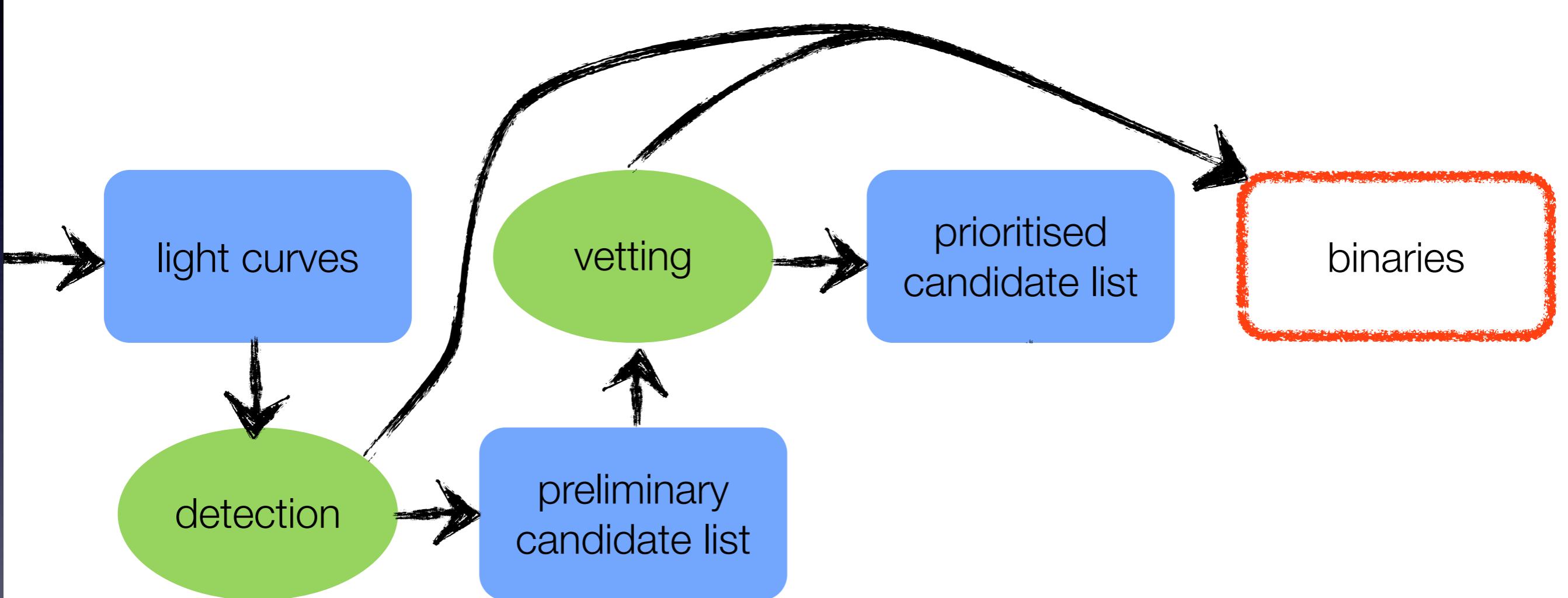
- ~ 82 % sont identifiés grâce aux courbes de lumière
- ~ 18 % nécessitent des observations de suivi au sol

Les pièges ...

Exemple, LRao2
~ 24 cibles sur un CCD
contaminées par la même
binaire à éclipse



Le “pipeline” exoplanètes: détecter, évaluer, trier, classer ..

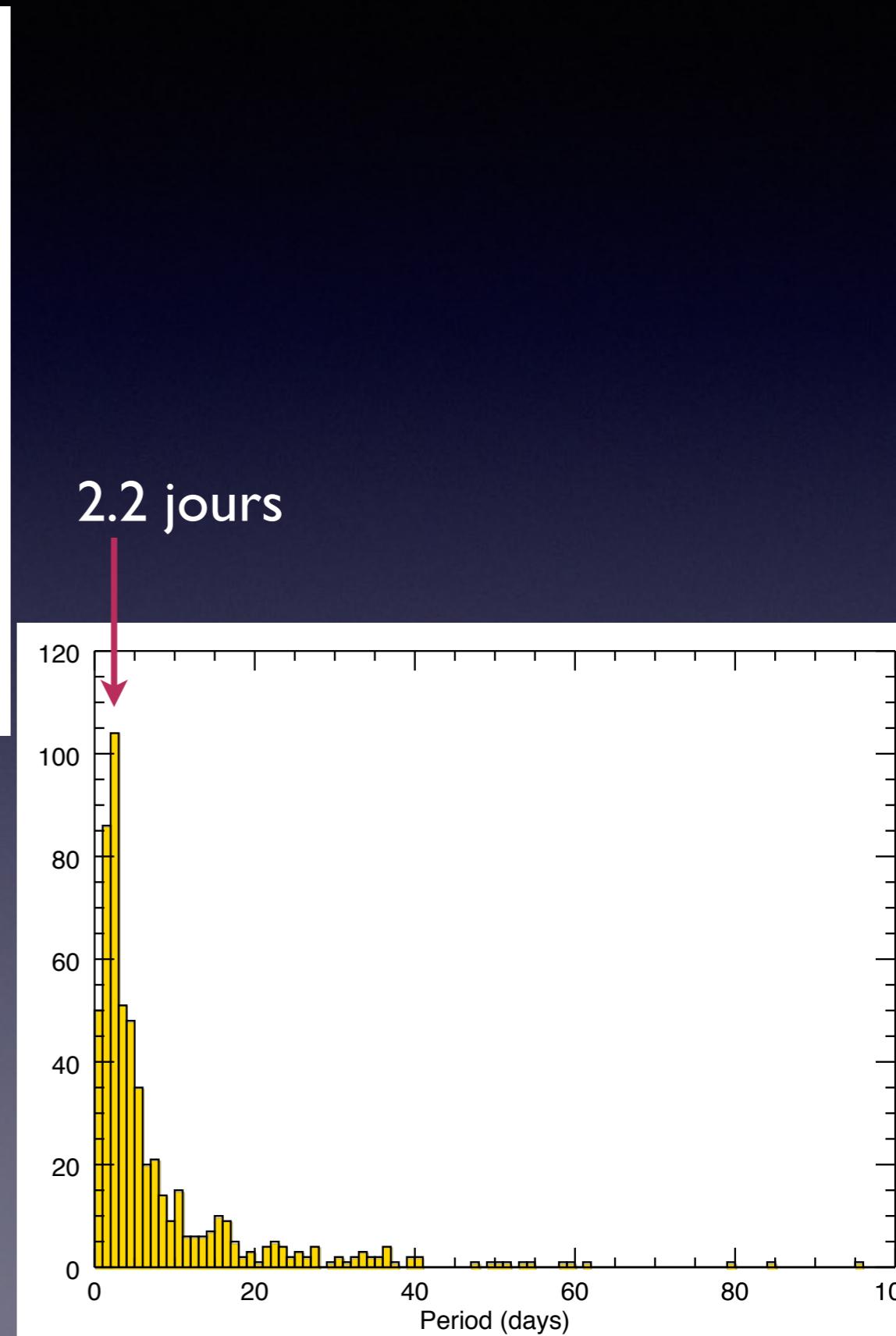
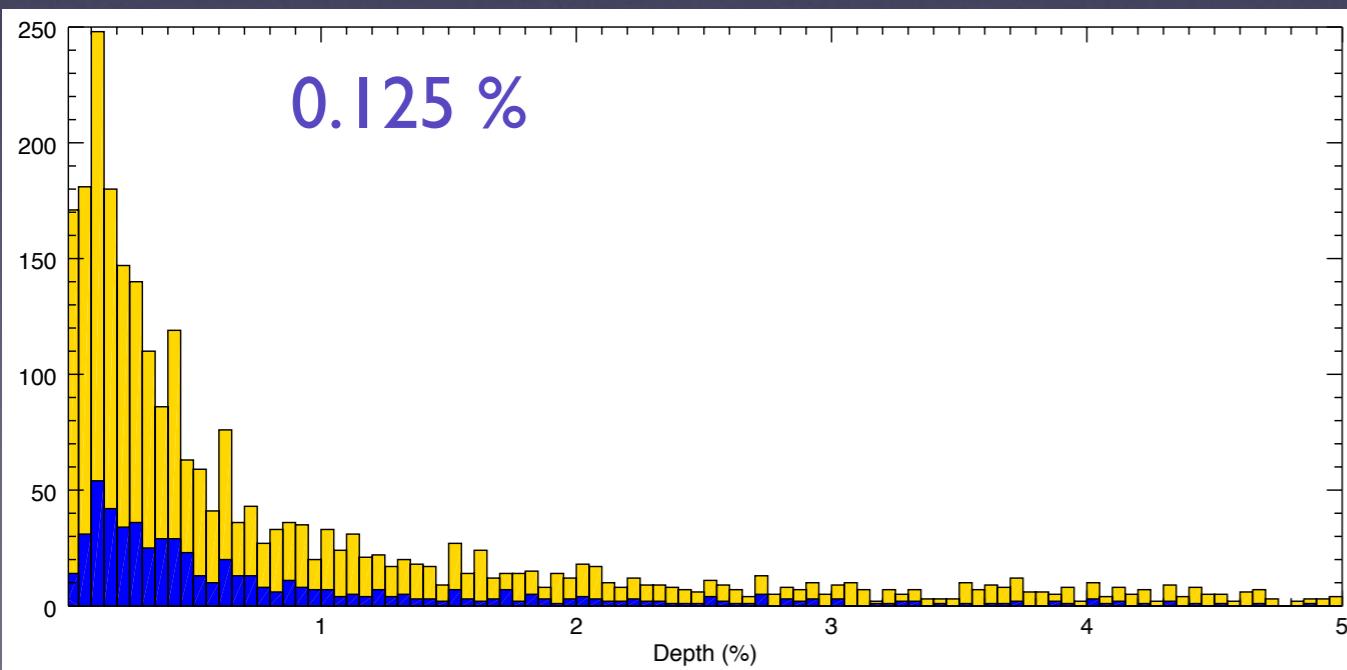
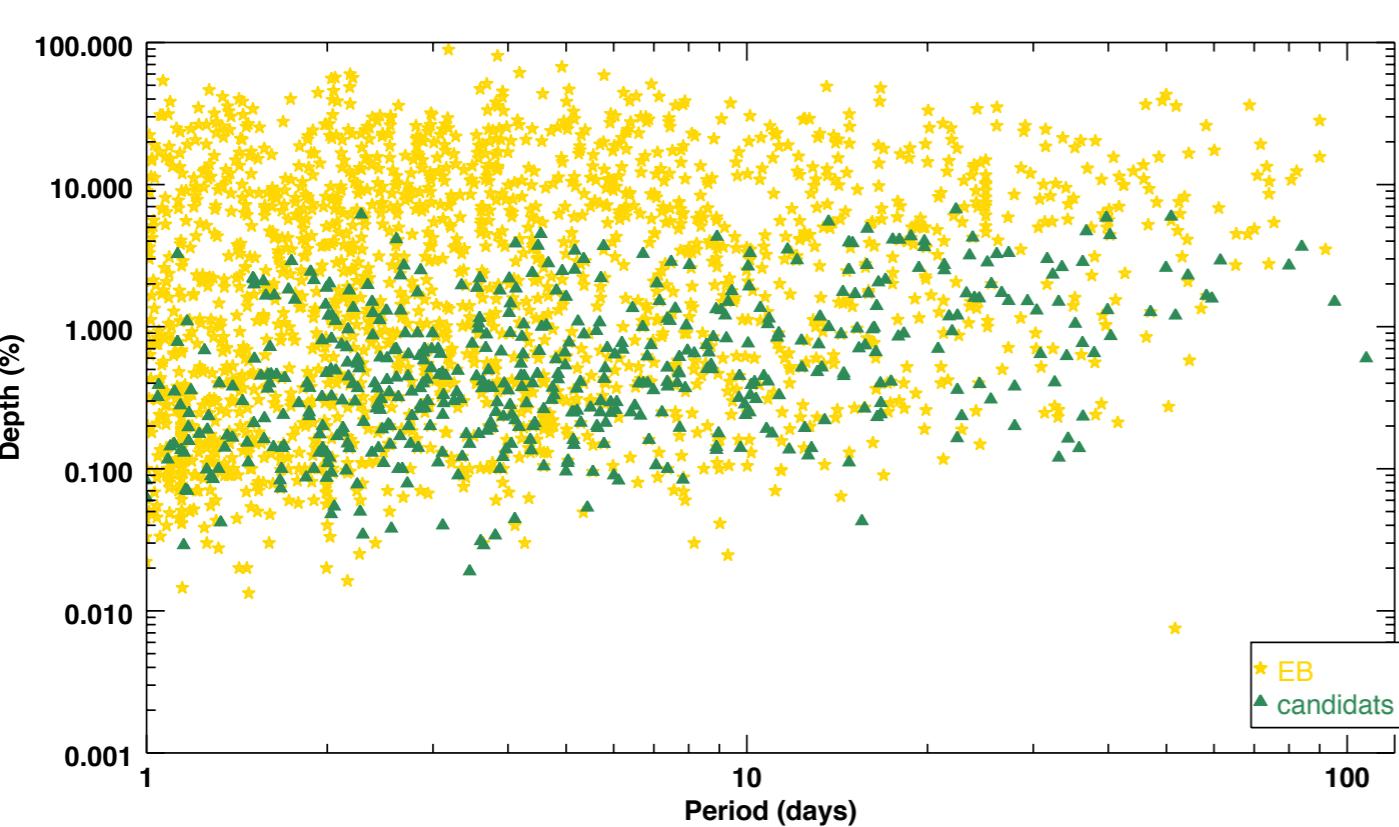


Le “pipeline” exoplanètes ... de l’intérieur



Entièrement fait main!

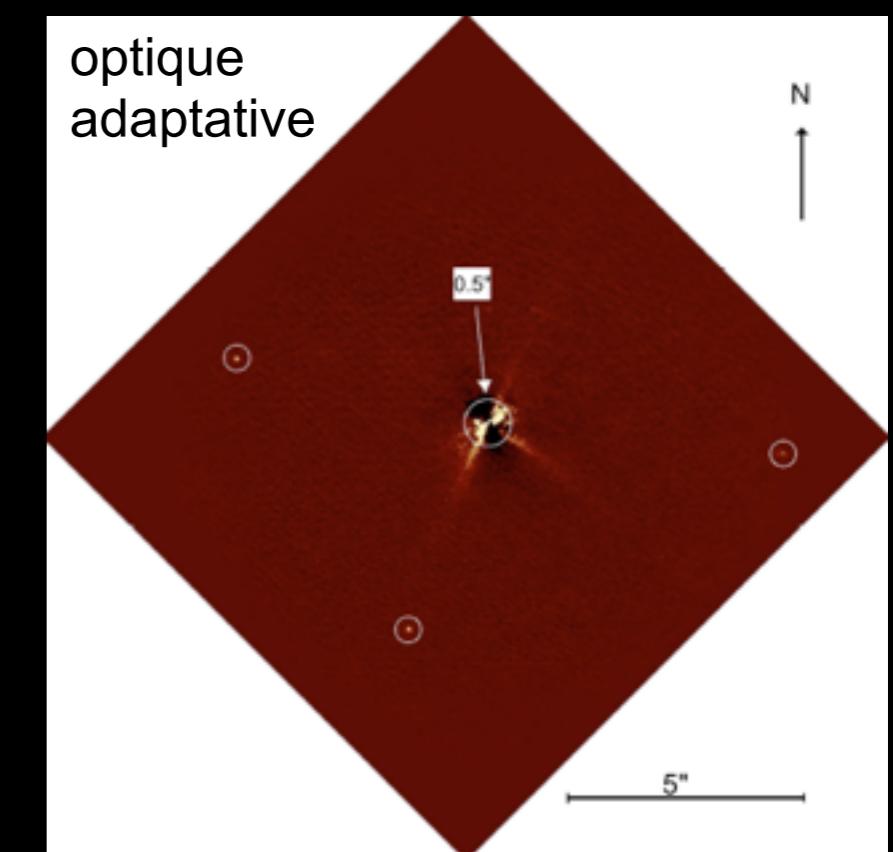
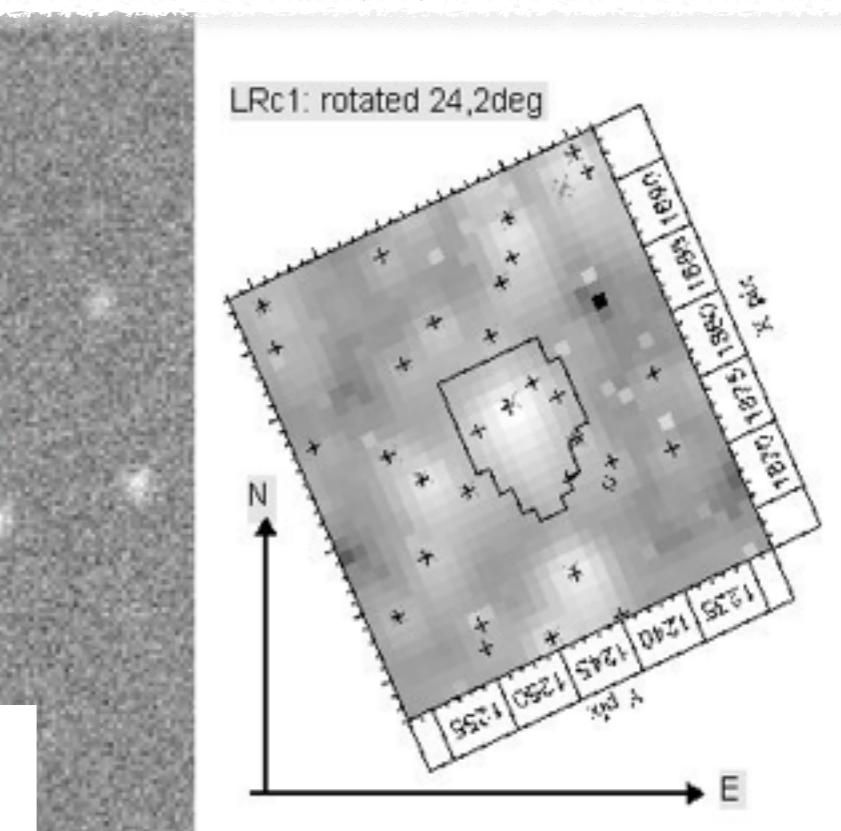
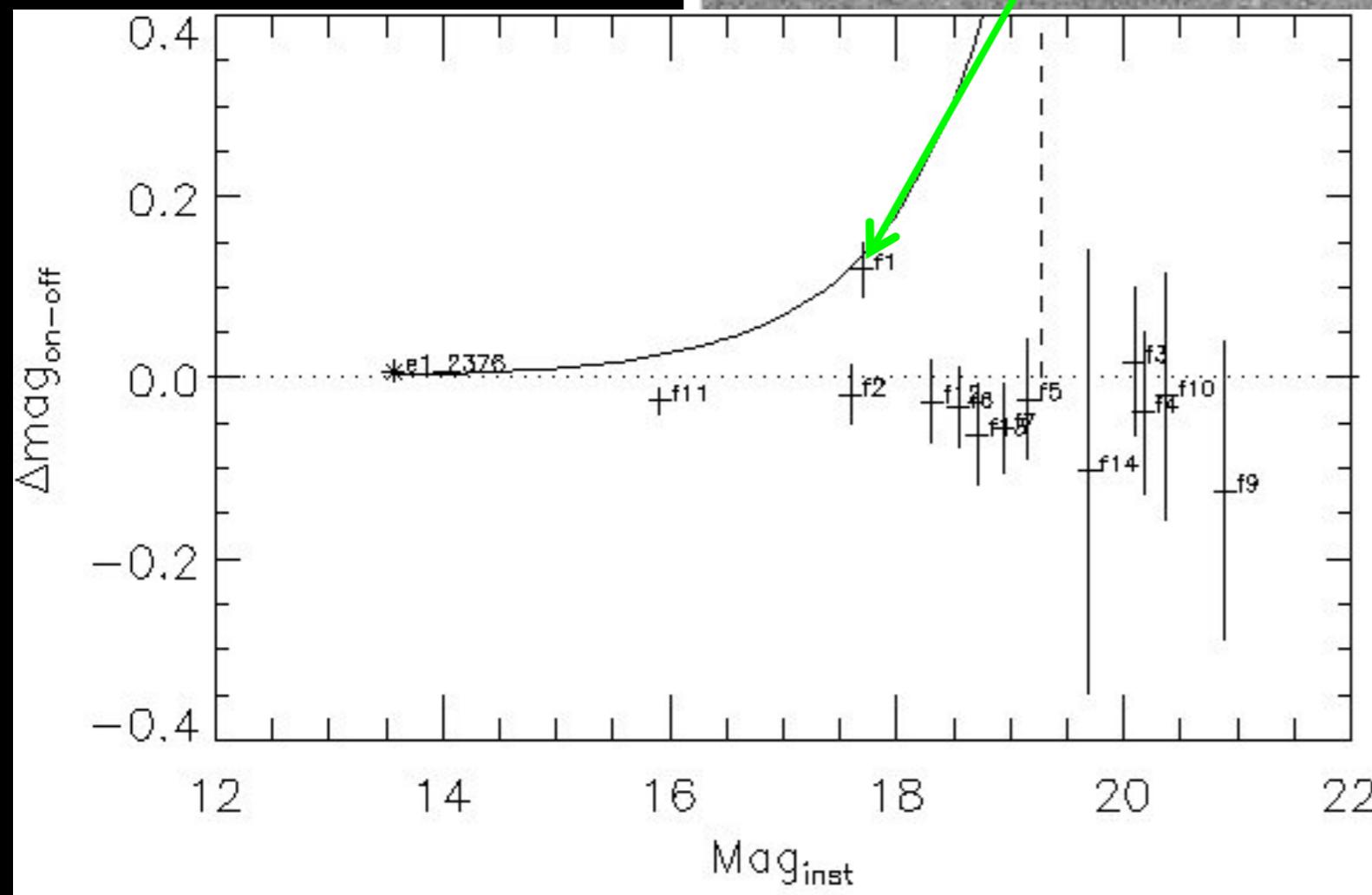
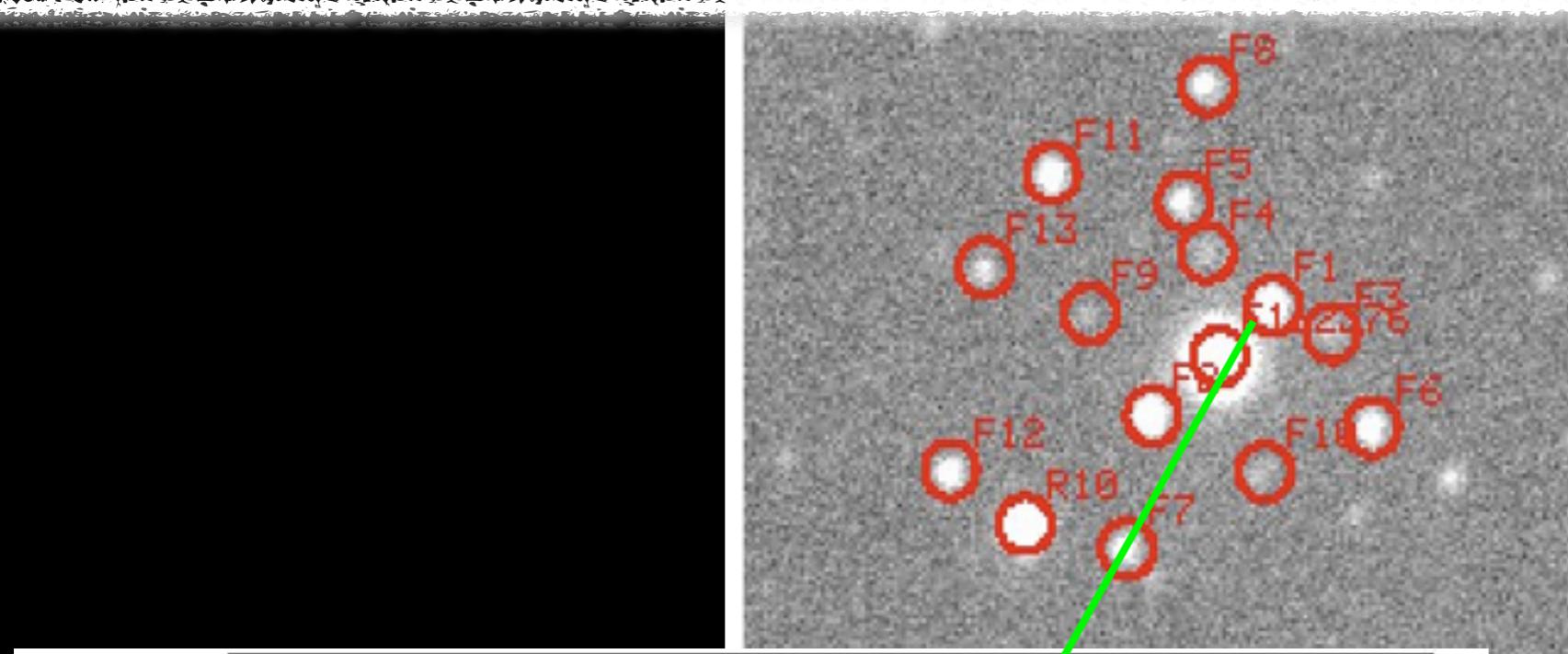
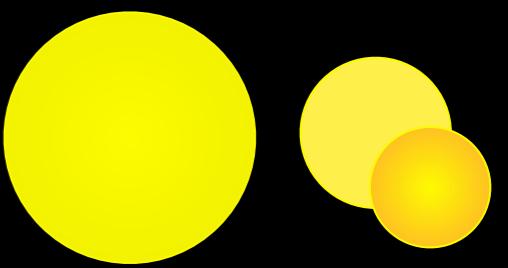
Et les planètes? Cachées parmi les candidats



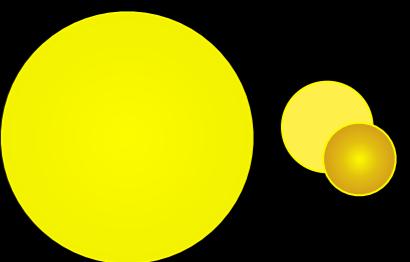
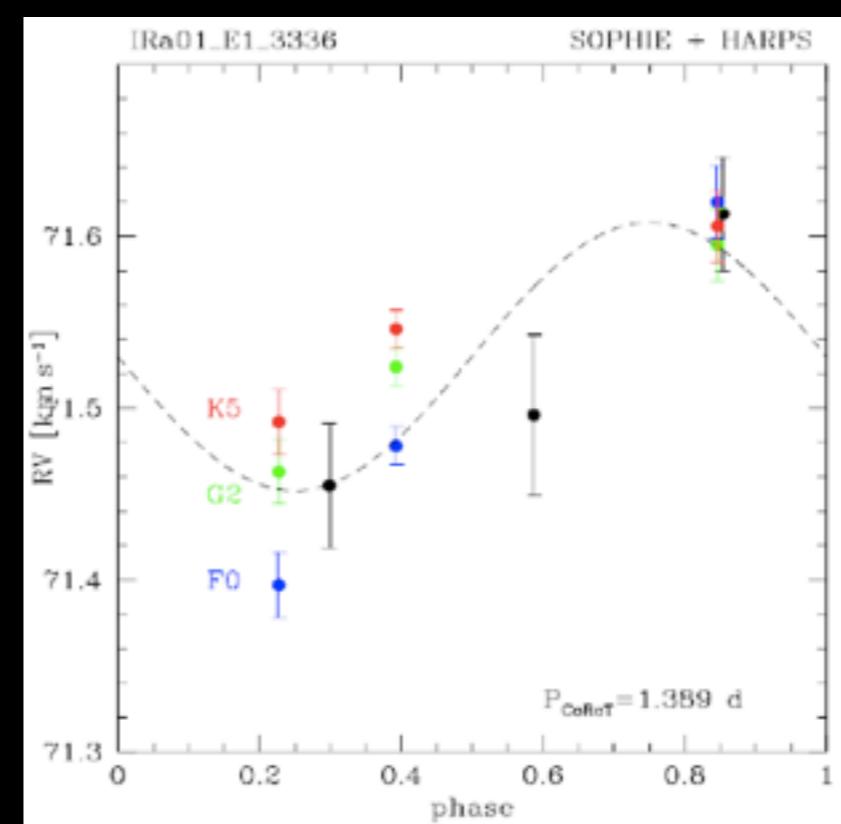
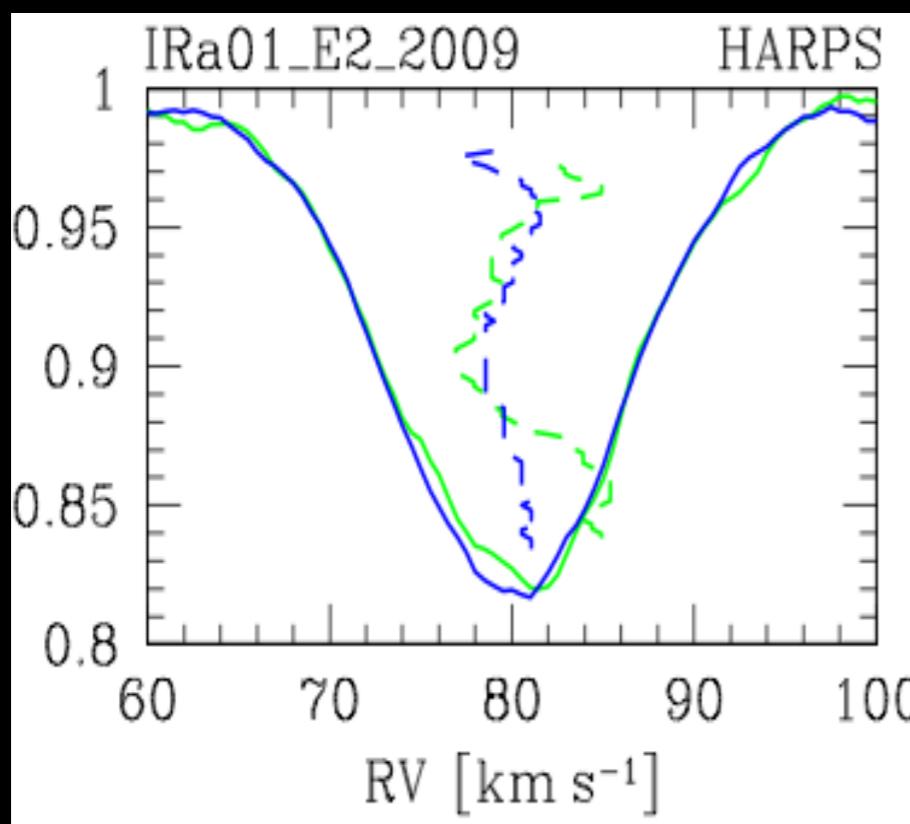
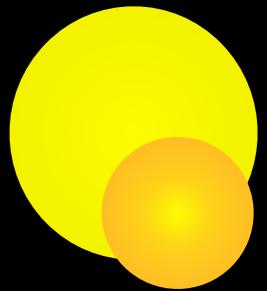
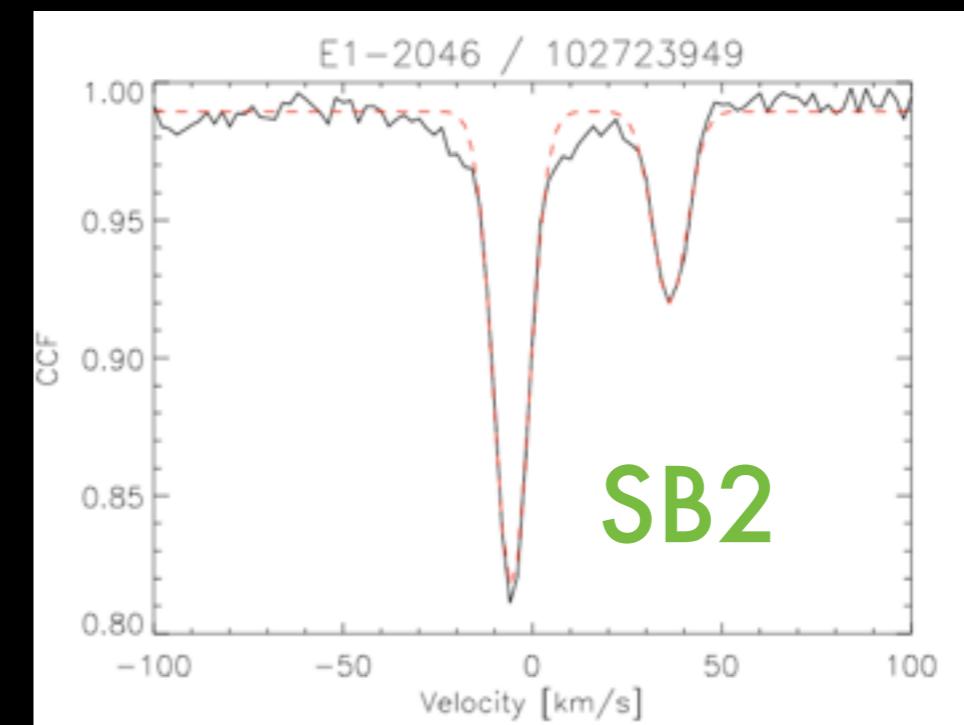
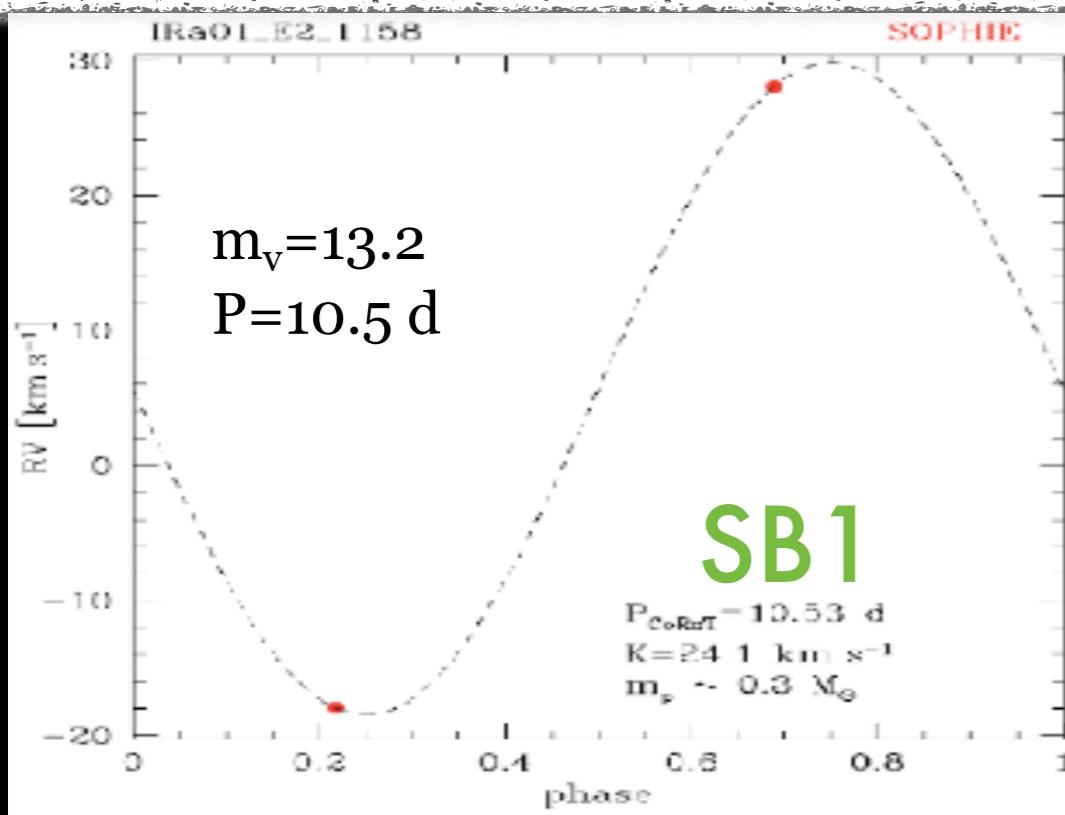
Les renforts au sol



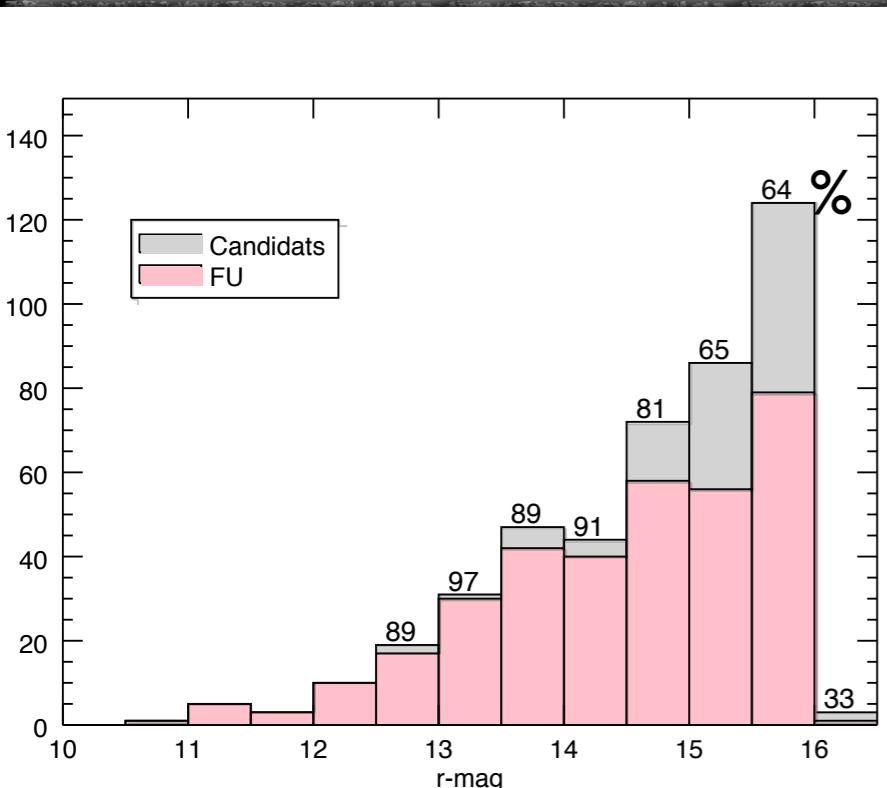
Vérification photométrique



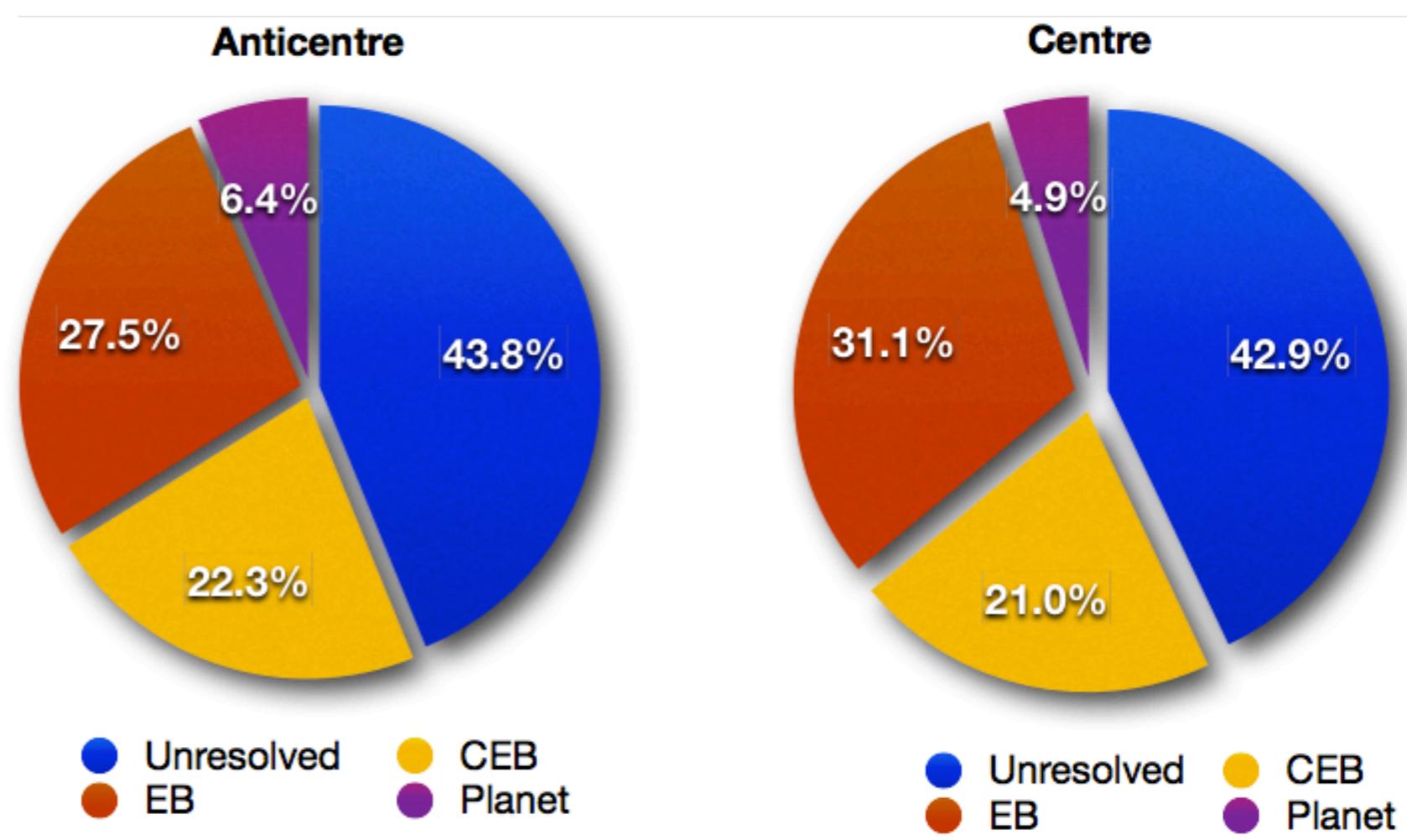
Vérification spectroscopique



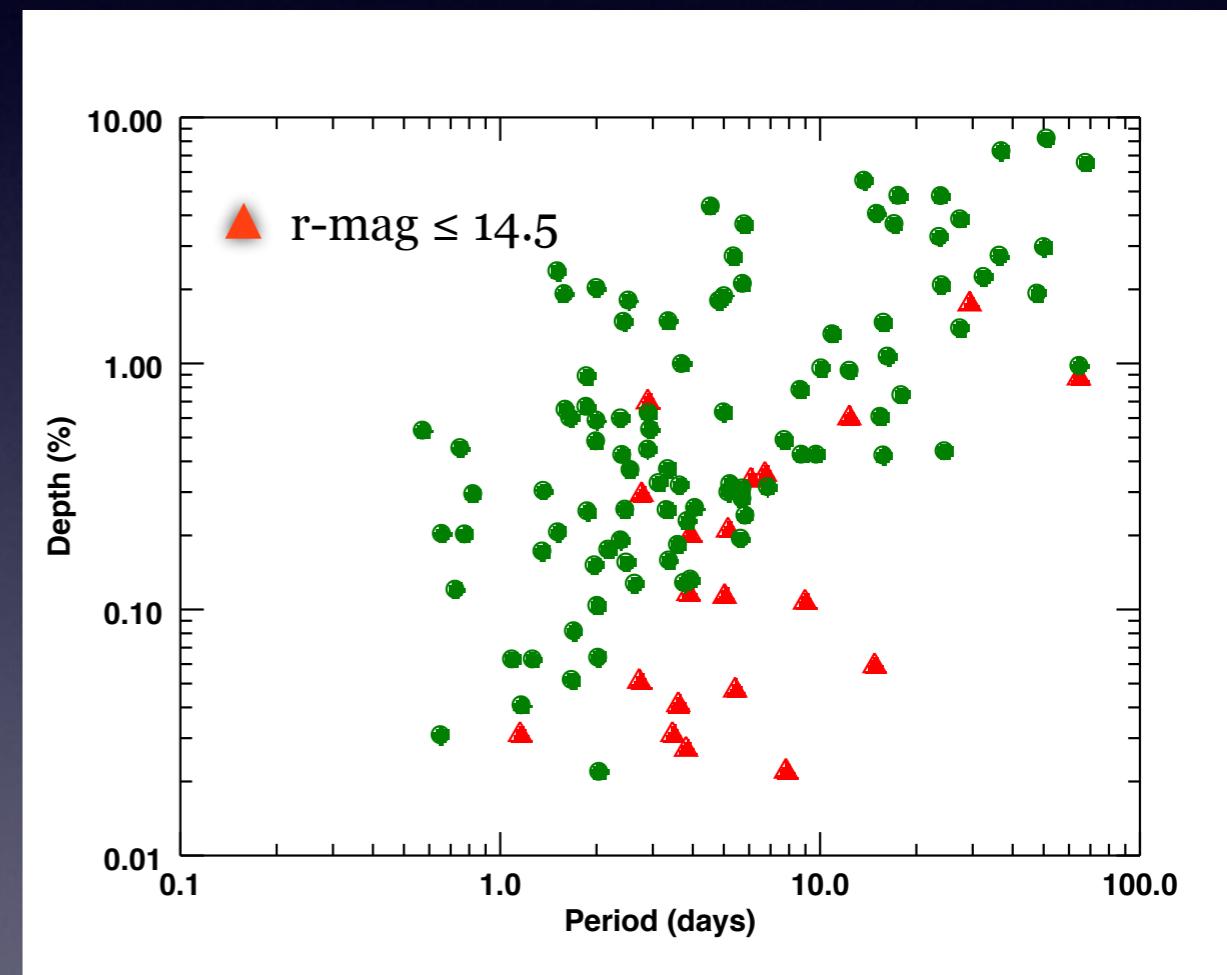
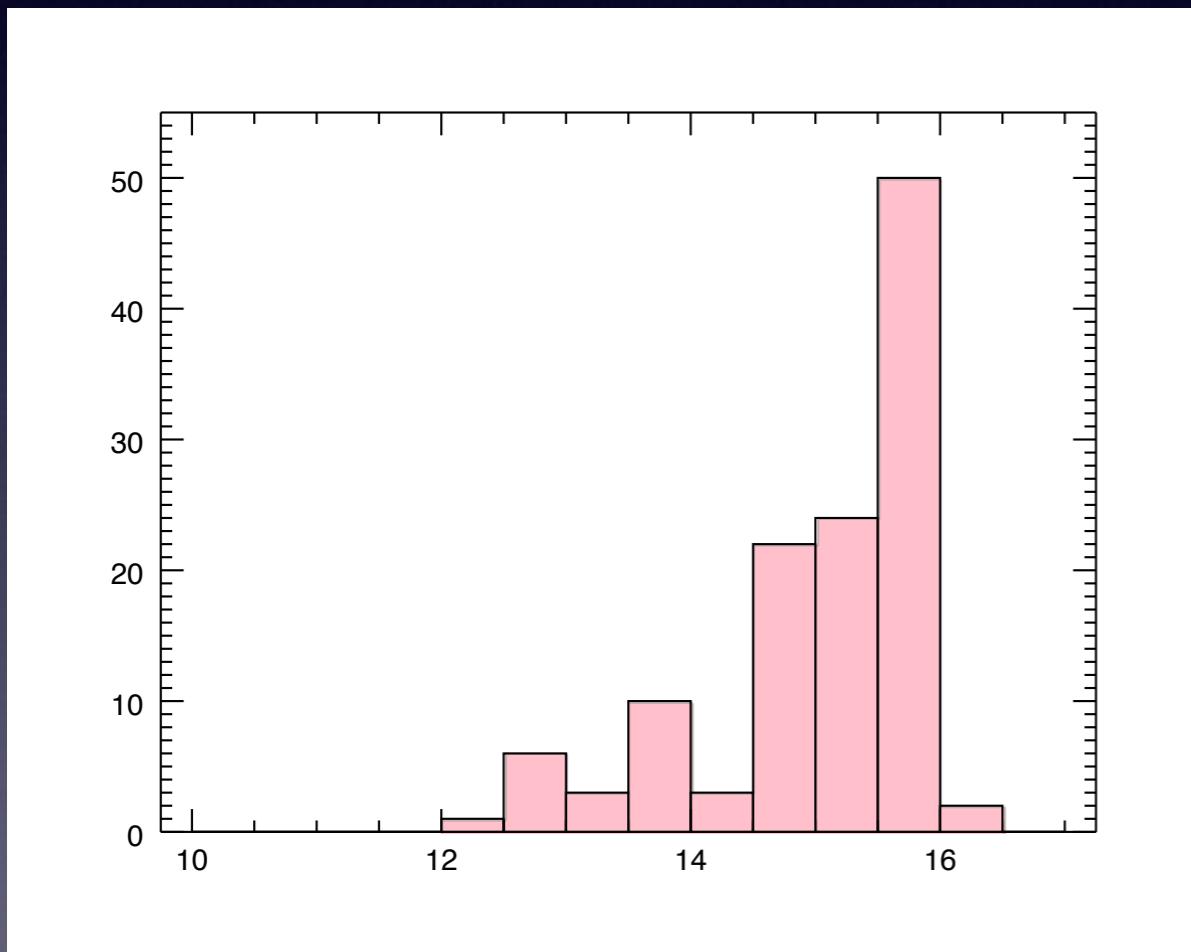
Observations au sol: bilan



~70 % des candidates ont été observés au sol avec différents instruments et techniques (418)



Il reste des cas non résolus



En résumé ...

