

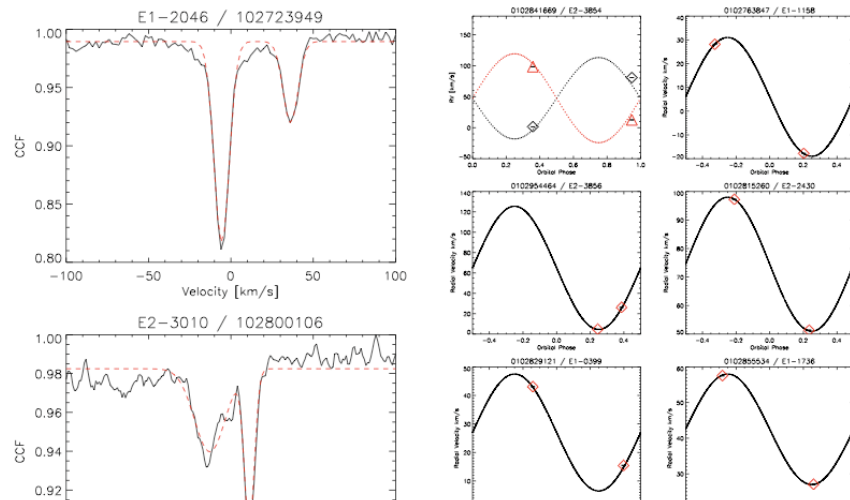
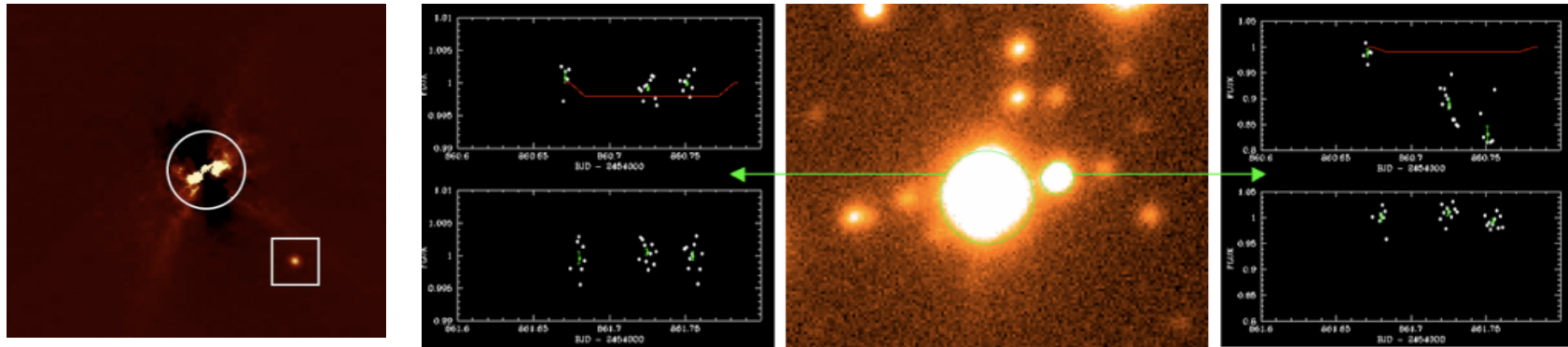
Prospects for future follow-up observations of CoRoT candidates and planets

Claire Moutou (LAM)
March 2013 - La Laguna



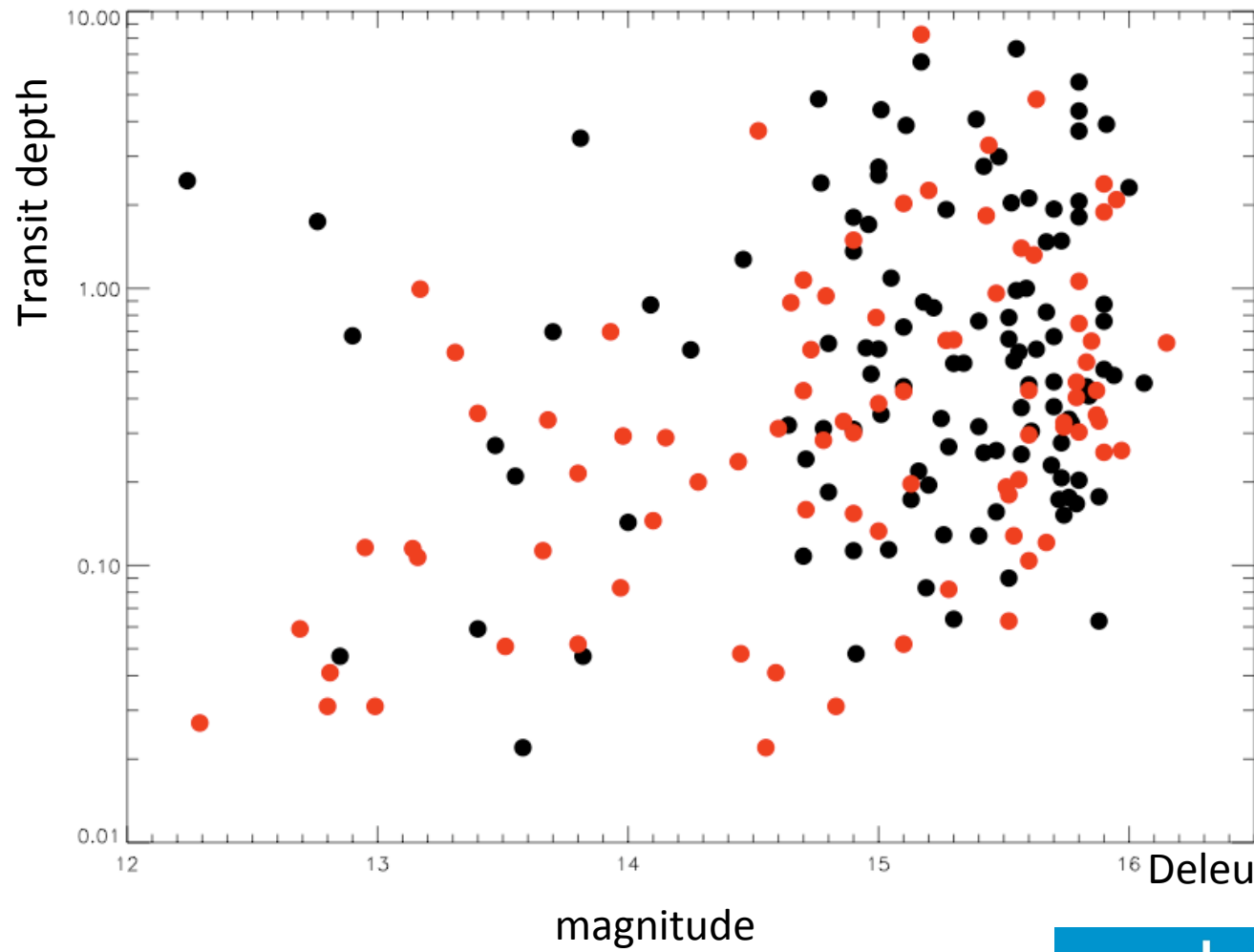
A huge follow-up effort

- ~370 nights of RV since Feb 2007 + stellar spectroscopy
- ~220 nights of imaging inc. adaptive optics
- ~600 candidates subject to ground obs; 50% resolved



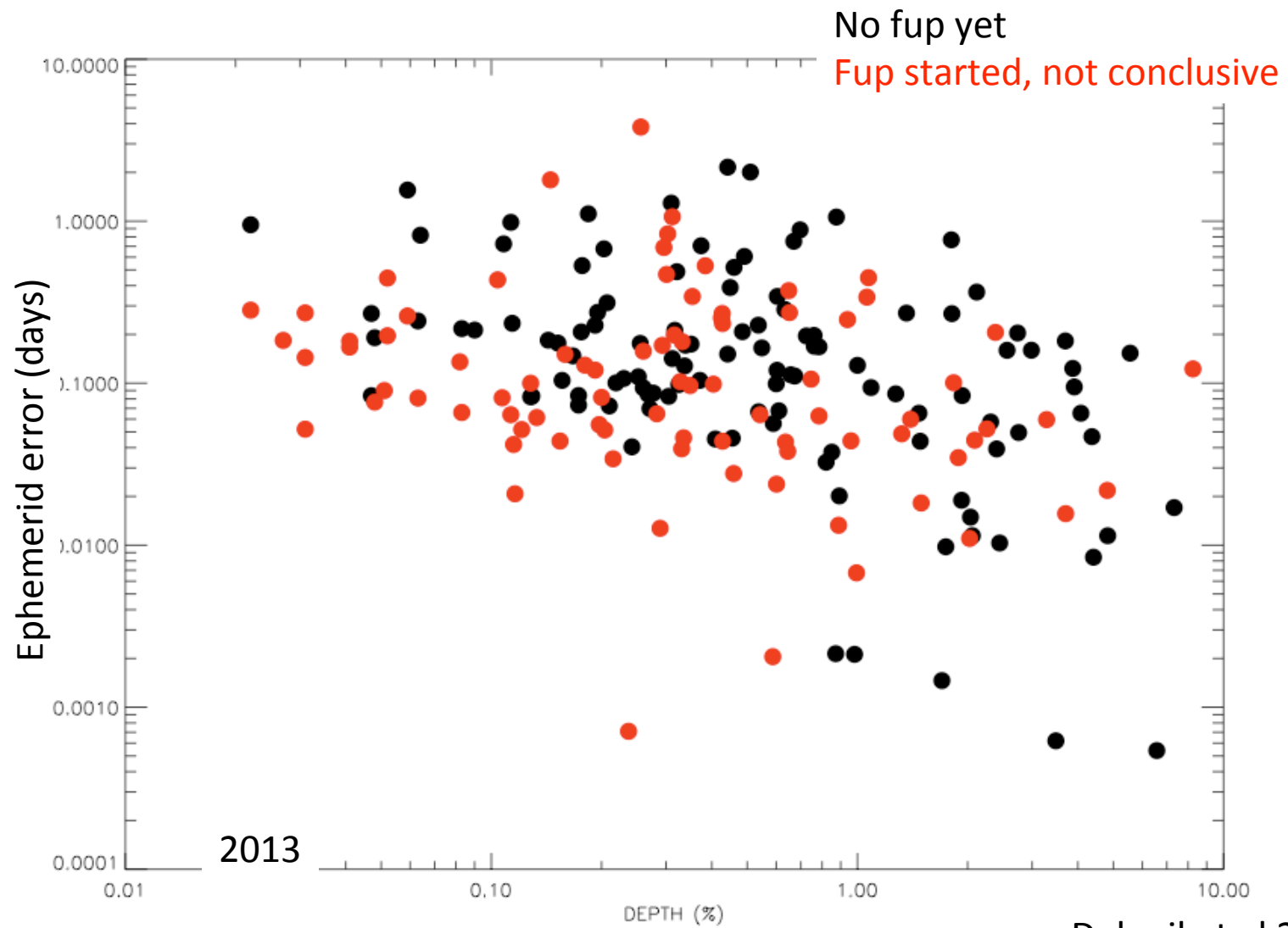
No fup yet

Fup started, not conclusive



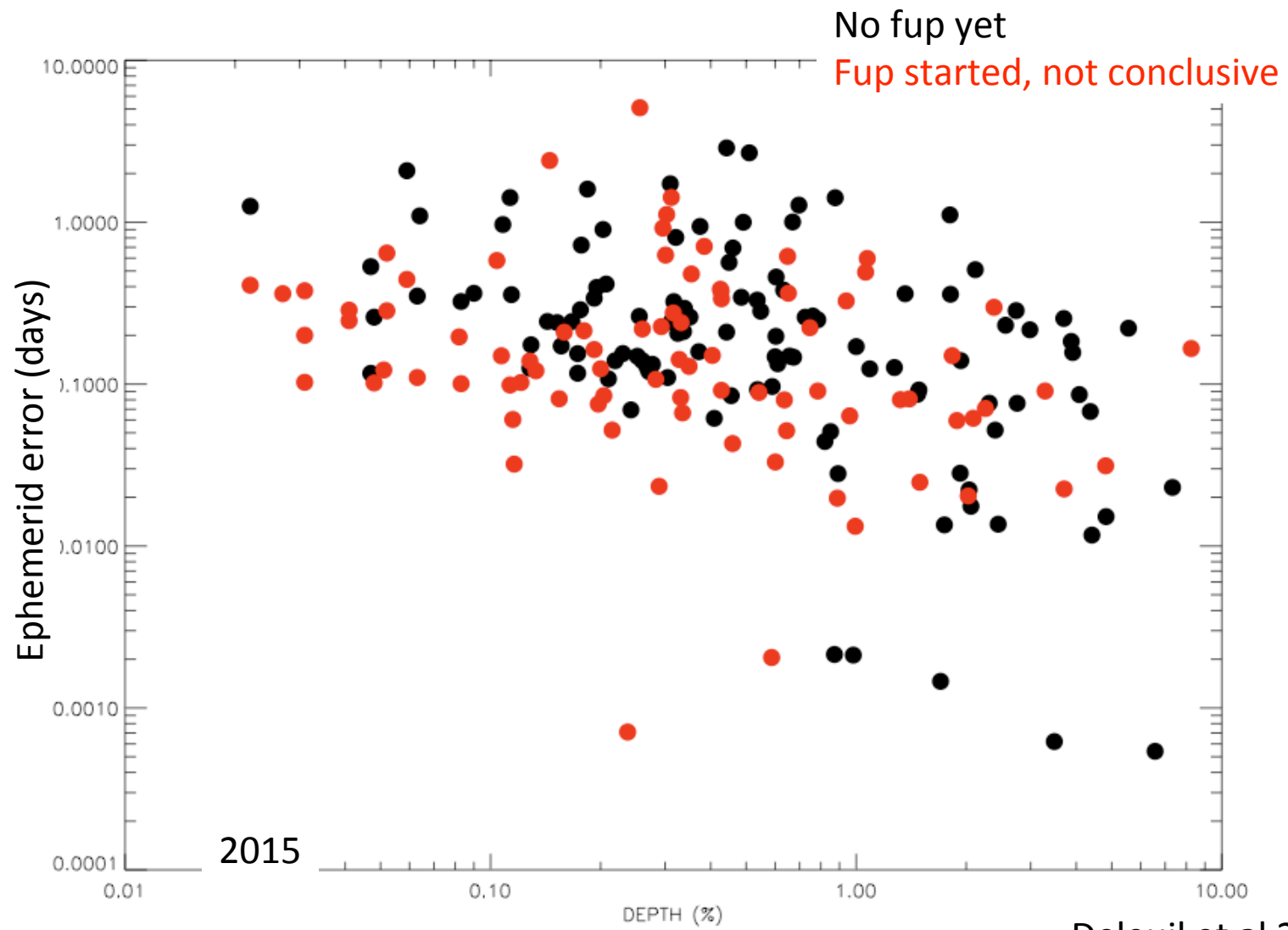
Deleuil et al 2013





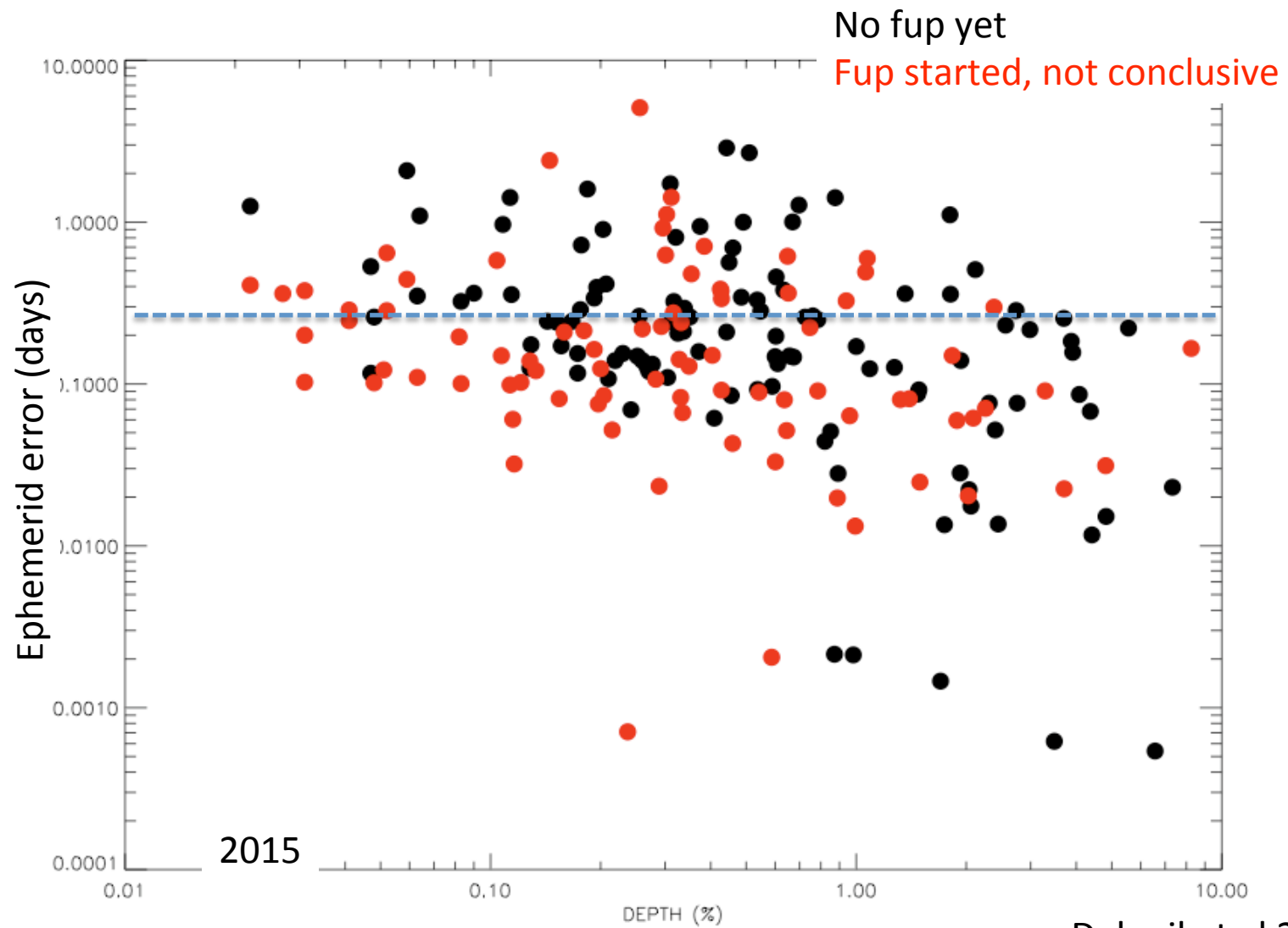
Deleuil et al 2013





Deleuil et al 2013





Deleuil et al 2013



About unresolved candidates

- 40% are $V > 15$ and low-rank transits, no Fup
- 20% have fast/hot star, no possible/easy RV
- 10%+ have lost ephemeris
- 30% have unconclusive fup observations: no significant RV variation; unclear on-off phot



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More Fup data would help in all cases

But a lot of resources are needed



Ground-based photometry

- Ephemeris
- Transit parameters
- Search for other transits in systems
- Search for TTVs
- Coloured transits
- Stellar characterization (all EXO targets)

Planets
Candidates

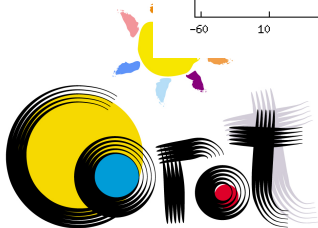
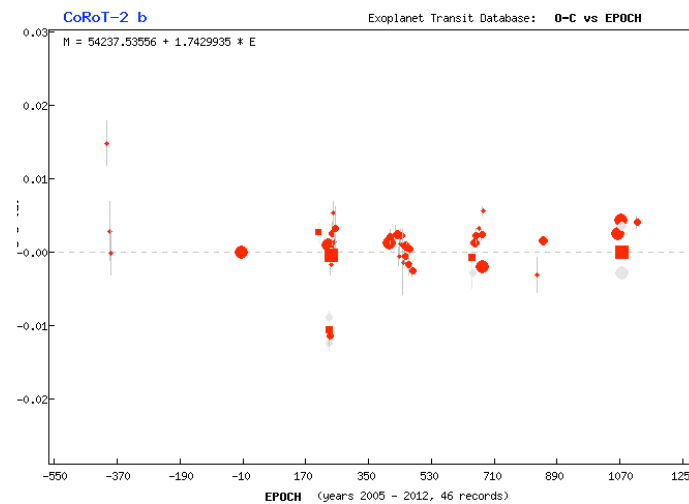
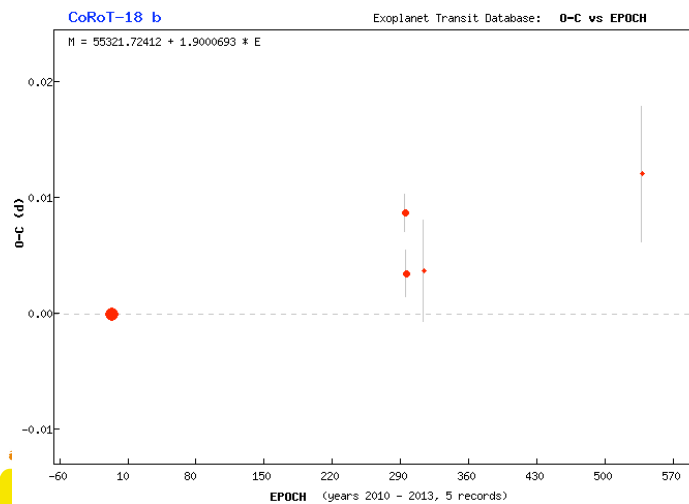


Role of Amateurs in CoRoT fup

- Keep ephemeris for most candidates
- Many CoRoT-2 transits at high precision
- Encourage your communities => ETD

CoRoT in ETD

CoRoT-1 b
CoRoT-10 b
CoRoT-11 b
CoRoT-12 b
CoRoT-13 b
CoRoT-17 b
CoRoT-18 b
CoRoT-19 b
CoRoT-2 b
CoRoT-20 b
CoRoT-3 b
CoRoT-4 b
CoRoT-5 b
CoRoT-6 b
CoRoT-7 b
CoRoT-8 b
CoRoT-9 b



Low-res spectroscopy

Planets
Candidates

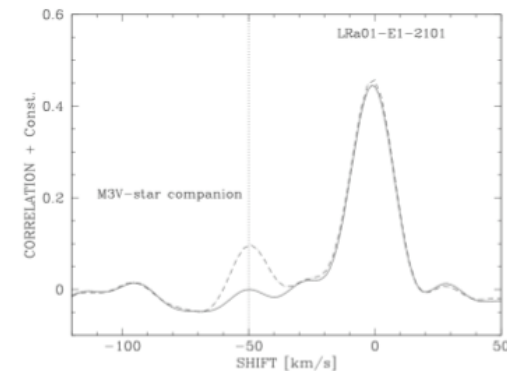
- Characterization of planet hosts
- Search for binaries
- Characterization of stellar population (multi object, see Eike Guenther's talk)



High-res spectroscopy

- Optical:
 - Accurate stellar parameters
 - Transmission spectroscopy
-
- Infrared:
 - Search for triple systems

Planets
Candidates



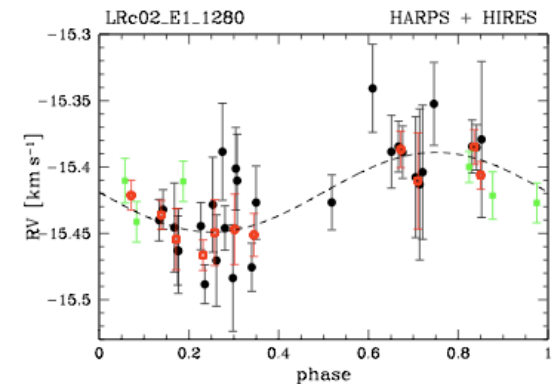
Guenther et al (2013)



Radial velocities

Planets
Candidates

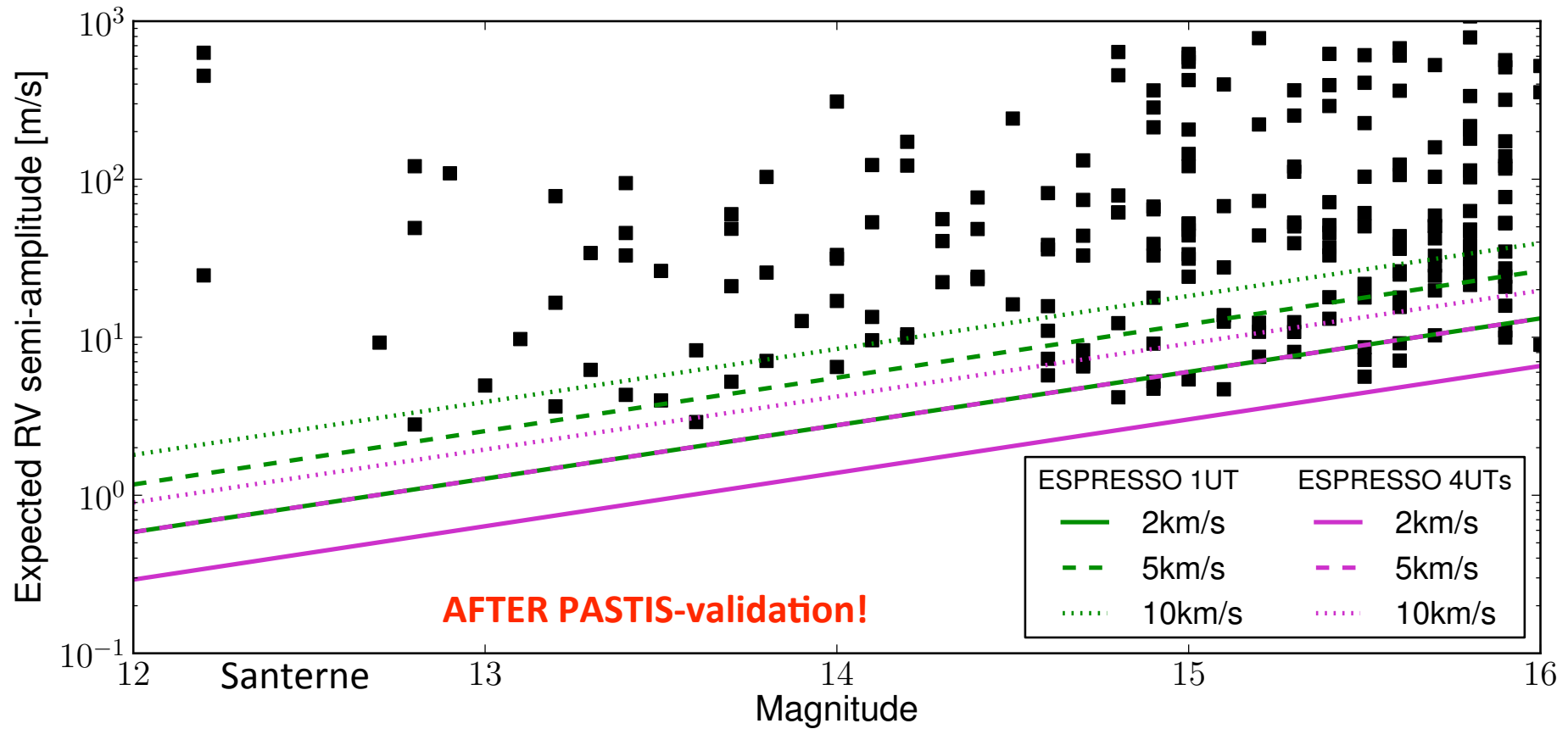
- Planet confirmation
- Mass characterization
- Search for other planets in system (2drifts)
- Constrain the eccentricity
- Constrain Spin-orbit alignment
- Search for low-mass binaries



Almenara et al 2013



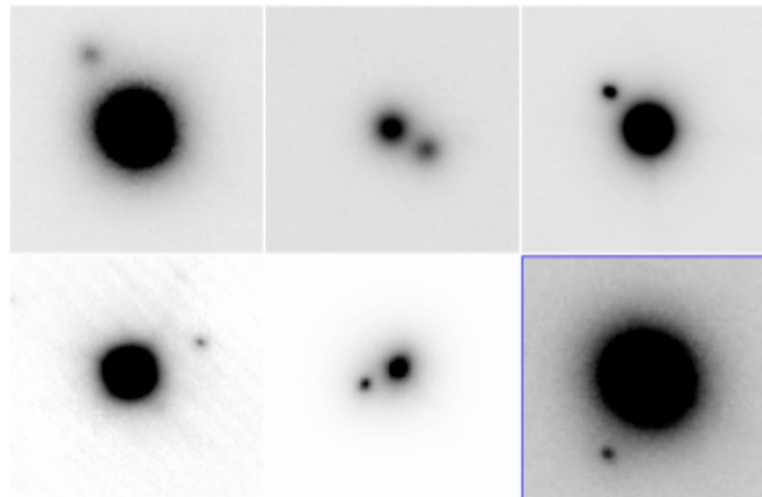
Characterization of small CoRoT candidates with ESPRESSO (>2016)



Adaptive optics

- Search for stellar companions : critical limitation for blend priors!
- If high dynamics can be reached, search for outer disk signatures or distant companions

Planets
Candidates



Guenther et al (2013)



Space observations

Planets
Candidates

- High precision transit profiles (moon, ring)
- Secondary transits
- Depth of primary transits
- Gaia: improvement of stellar parameters (thus planet radii)



Strategy: summary

- Case by case strategy for **candidates** depends on:
 - Depth, magnitude, transit duration
 - Ephemeris error when relevant
 - Existing follow-up observations
- Case by case strategy for **planets** depends on:
 - Refine planet radius (transit)
 - Refine stellar parameters (LD, T_{eff} , $\log g$, M/H)
 - Get additionnal information: ecc, obliquity



questions

- Should we anticipate new candidates from re-analysis of previous runs?
- Should we coordinate complementary observations of unresolved candidates? Or just encourage the community (since they are soon public)
- Should we spend resources re-observing known planetary systems?
- More diverse techniques, more focused proposals: who is willing to contribute to these fup tasks?

