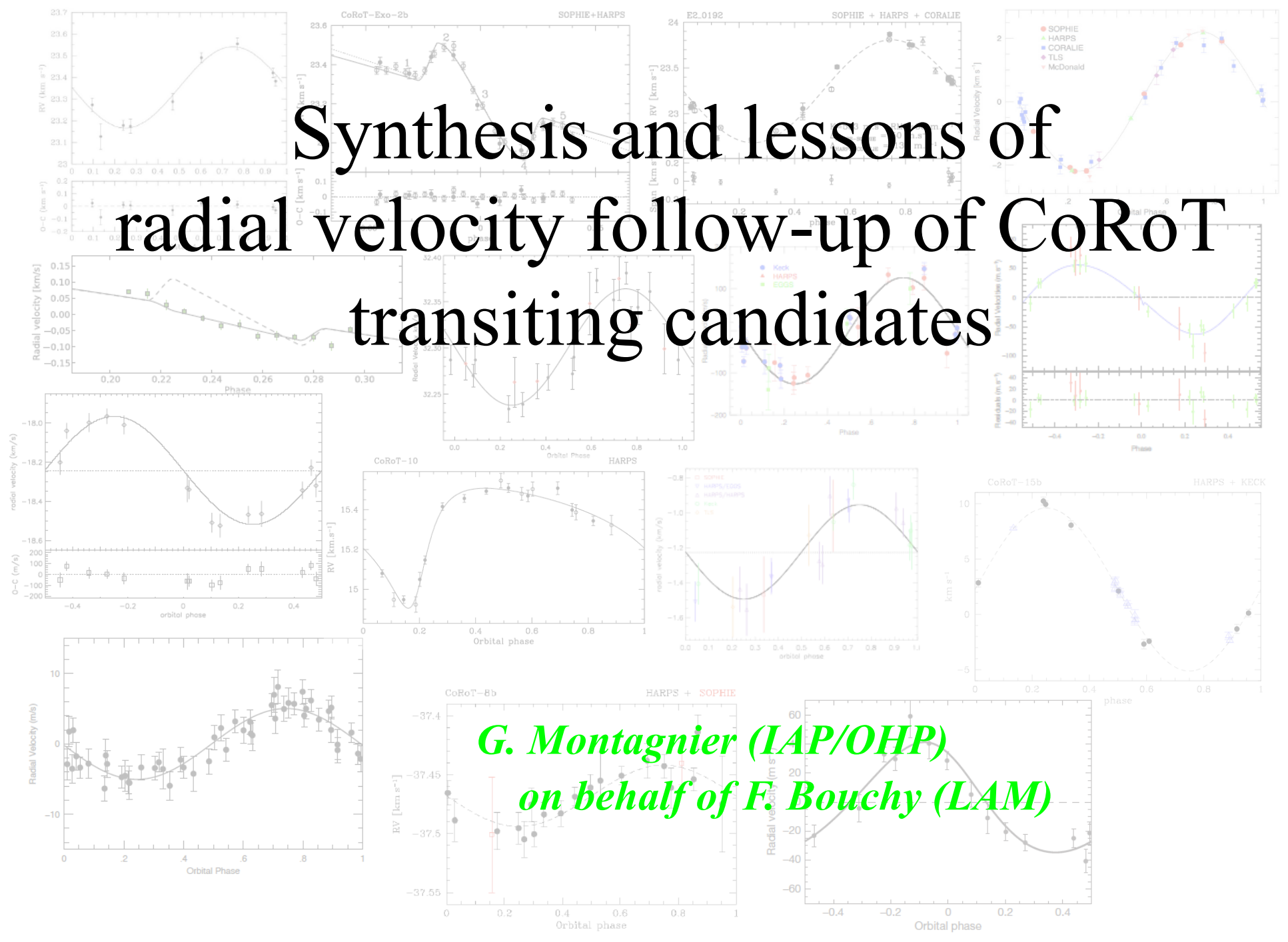


Synthesis and lessons of radial velocity follow-up of CoRoT transiting candidates



*G. Montagnier (IAP/OHP)
on behalf of F. Bouchy (LAM)*

Radial velocity follow-up of CoRoT transiting candidates

Main goals:

- establish the nature of the transit events
- characterize the mass and eccentricity from earth-like planets to brown-dwarfs.

By-product:

- Central star spectroscopic parameters
- Stellar activity indicators and corrections
- Spin-orbit angle measurement (Rossiter-McLaughlin)
- Long term follow-up (multiple systems)

Main Actors :

F. Bouchy, C. Moutou, R. Diaz, A. Santerne, M. Deleuil (LAM)

G. Montagnier, G. Hébrard (IAP/OHP)

H. Deeg, D. Gandolfi (IAC)

H. Hatzes, E. Guenther (TLT)

M. Endl, W. Cochran, P. MacQueen (McDonald)

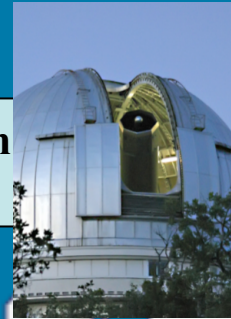
CoRoT radial velocity facilities



HIRES/10-m
26 nights



FIES/2.5-m
54 nights



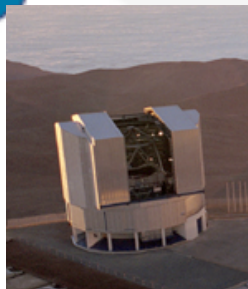
SOPHIE/1.93-m
120 nights

701 meas. on 175 candidates



HARPS/3.6-m
150 nights

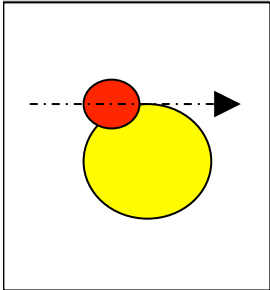
FLAMES/8.2-m
4 nights



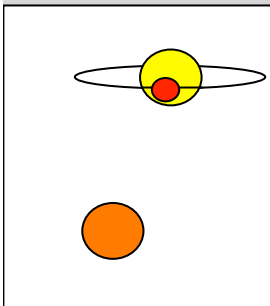
Since march 2007
RV obs. on 306 targets
among the 516 candidates

1368 meas. on 196 candidates

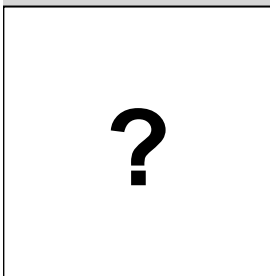
A zoo of false positives



Grazing eclipsing binaries

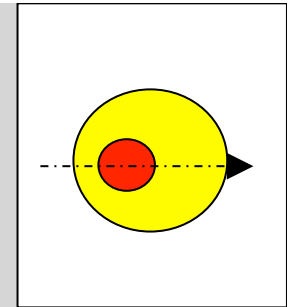


Background eclipsing binaries (inside CoRoT window)

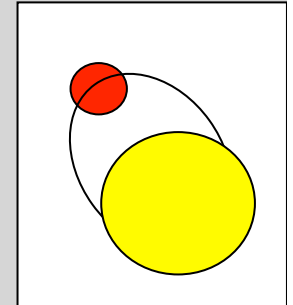


Hot and fast Rotating star no signif. RV variations

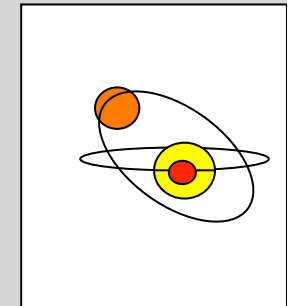
Eclipsing M dwarfs



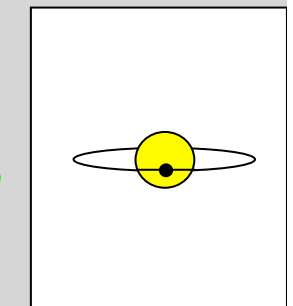
Secondary-only eclipsing binaries



Blended eclipsing binaries (inside seeing)

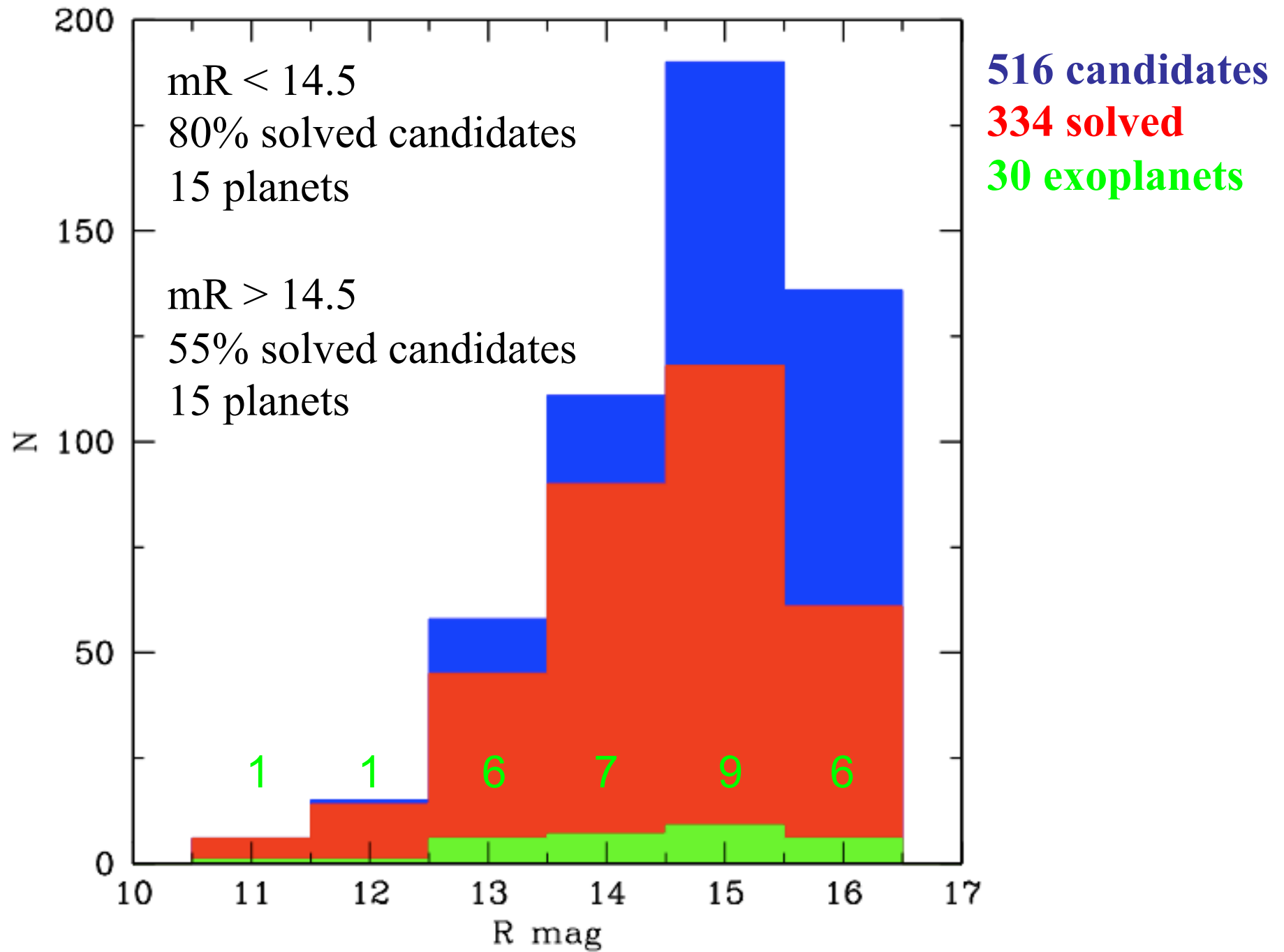


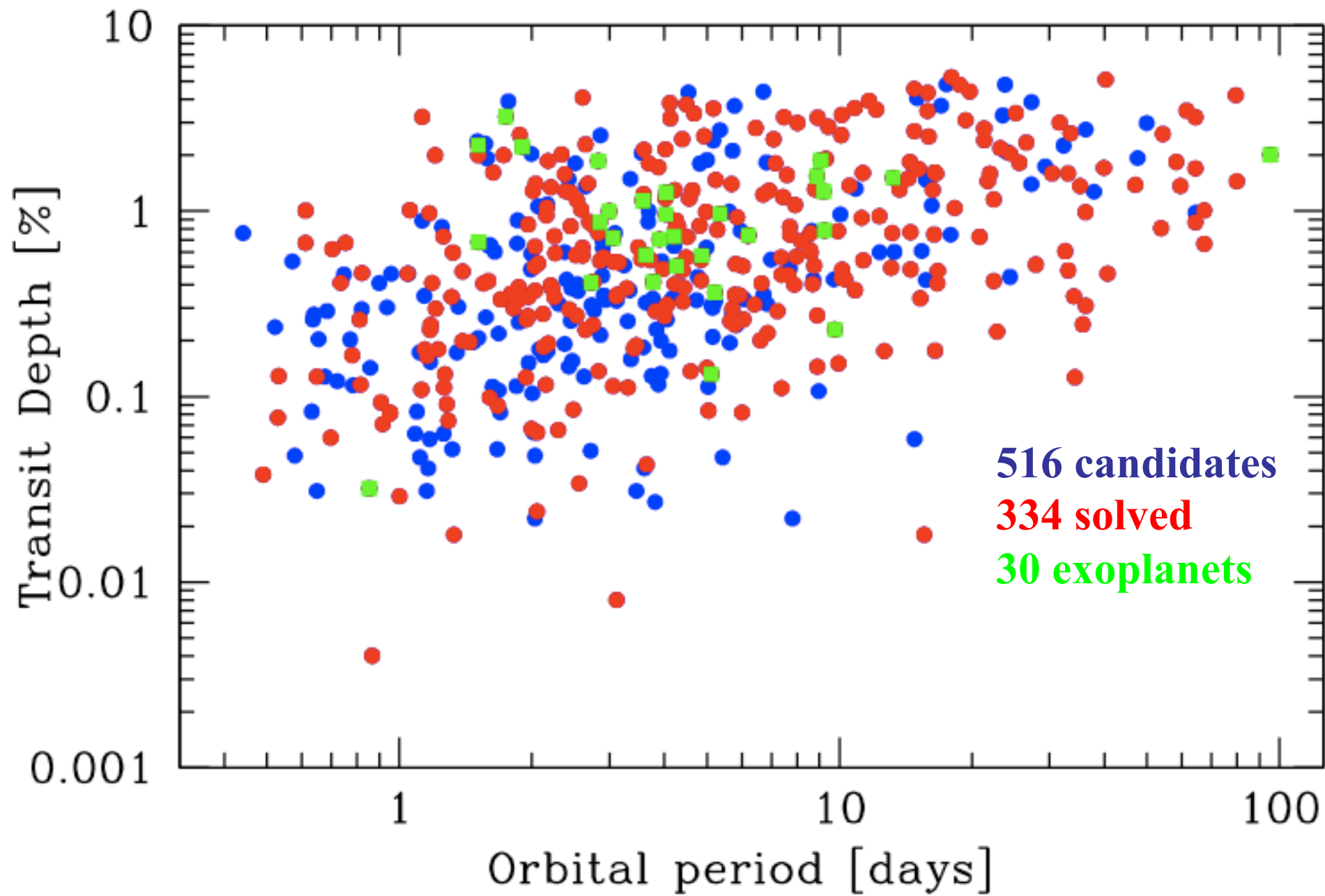
Transiting planets

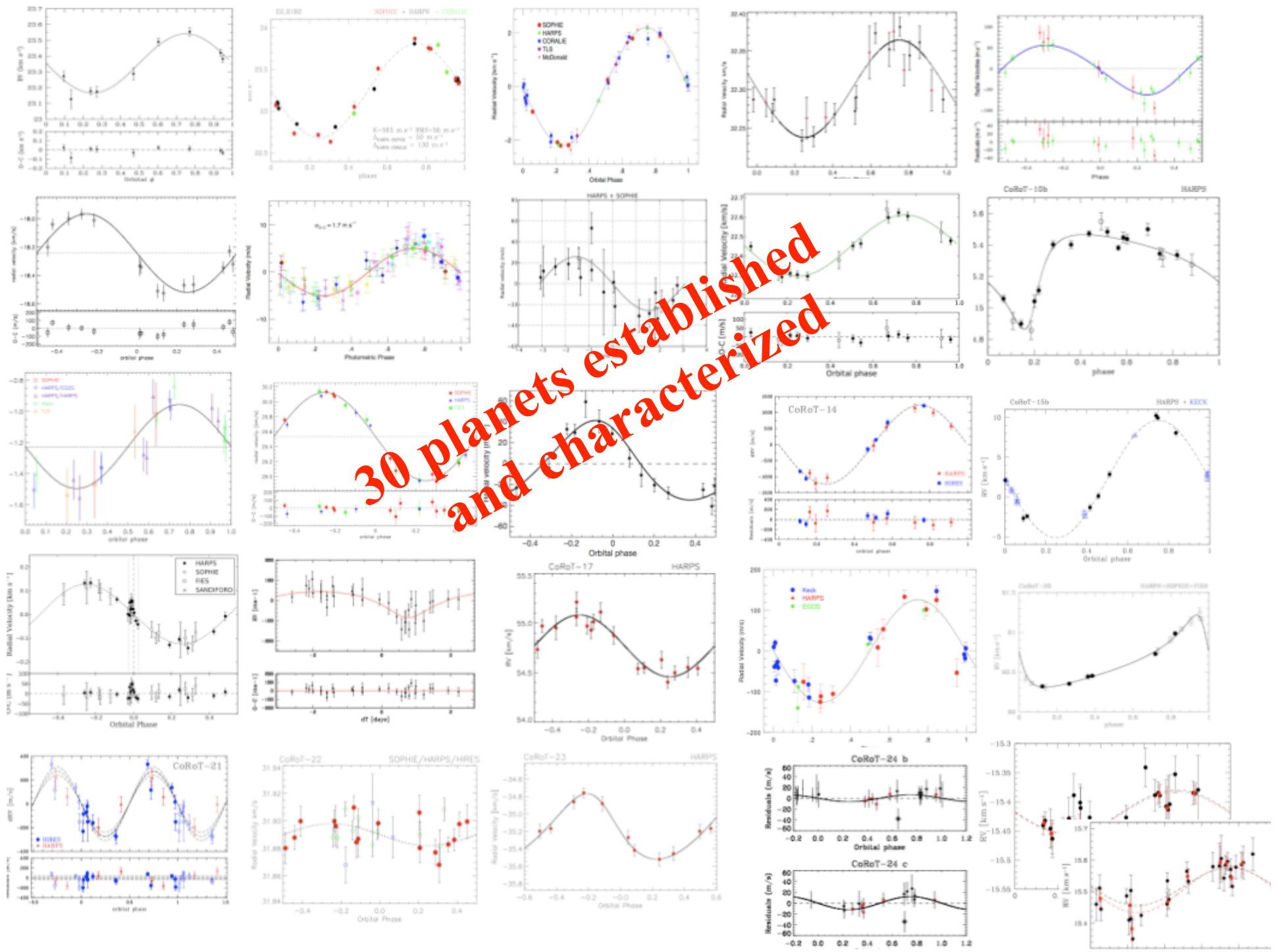


Assets of SOPHIE and HARPS for RV follow-up

- High flexibility in the scheduling
- Automatic and real time pipeline at the telescope
- Specific tools available at the telescope :
 - *background moon light correction*
 - *bisector span*
 - *activity index, vsini, [Fe/H]*
 - *CCF masks library A, F, G, K, M*
 - *σ_{RV} exposure time calculator*
- Daily updated data bases







Other benefits from RV Follow Up

- Better knowledge of false positives and improvement in the ranking of transiting candidates
- Long term FU of known CoRoT planets
- Characterization of low mass eclipsing binaries (G. Montagnier talk)
- Spin-Orbit obliquity using Rossiter-McLaughlin effect (CoRoT-1b, 2b, 11b, 18b,19b)
- Additional constraints for planet validation tool (R Díaz, A. Santerne and J.-M. Almenara talk)

Long term RV follow-up of known CoRoT planets

14 known CoRoT planets with RV data over more than 2 years

Long term RV follow-up of known CoRoT planets

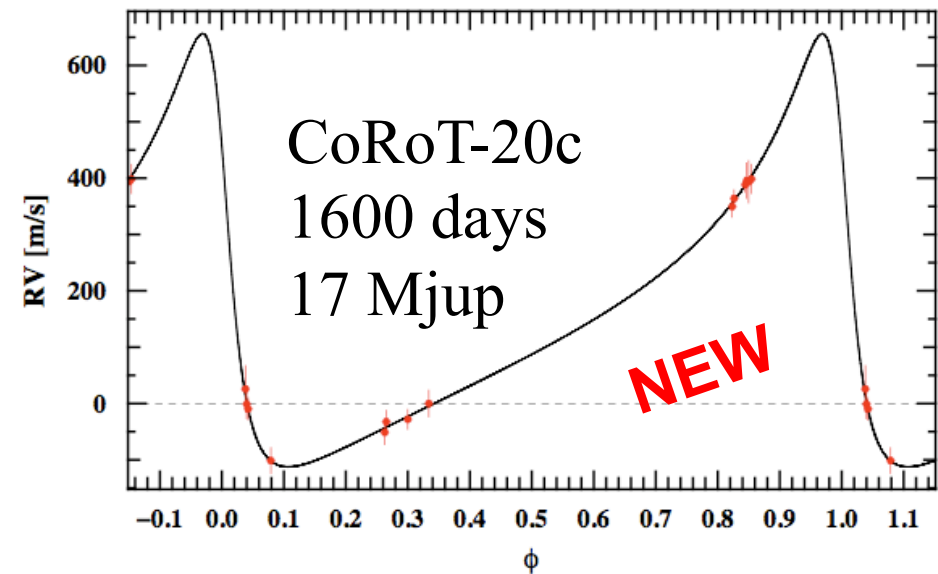
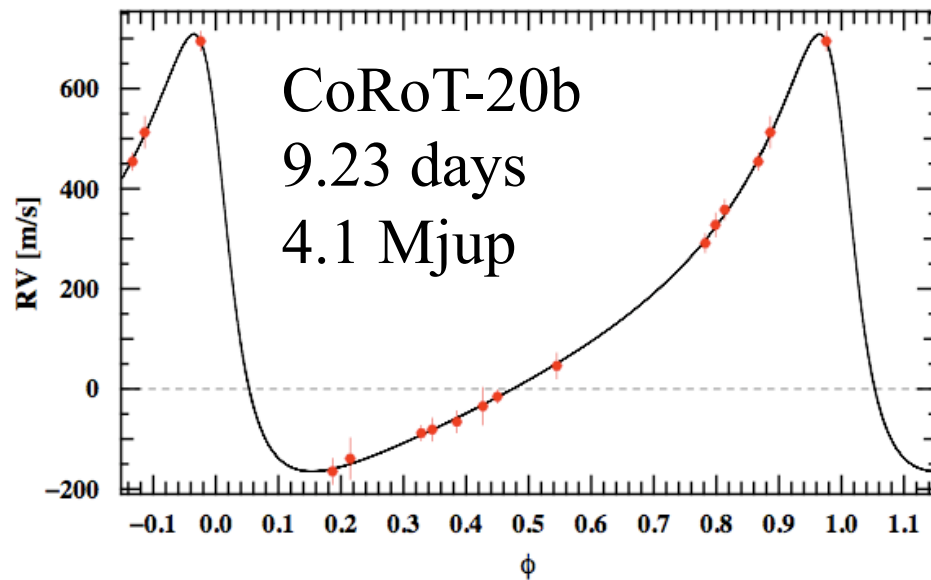
14 known CoRoT planets with RV data over more than 2 years

- CoRoT-24 RV show a long term curvature.

Long term RV follow-up of known CoRoT planets

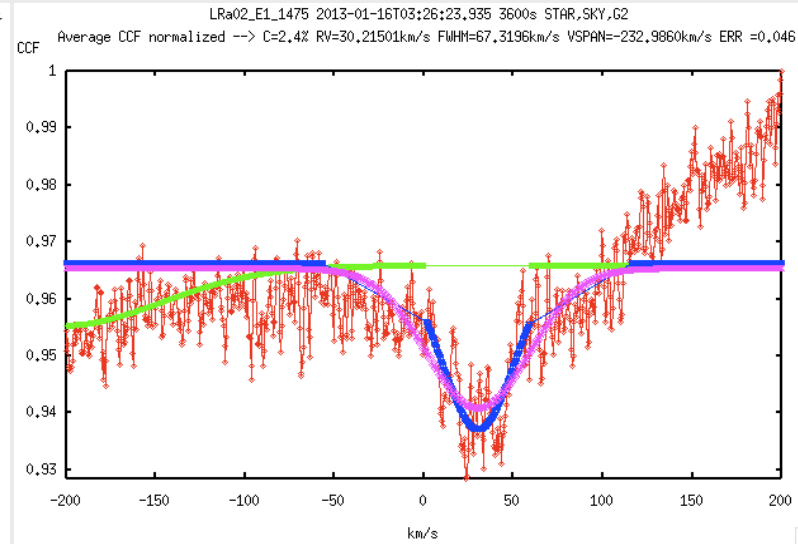
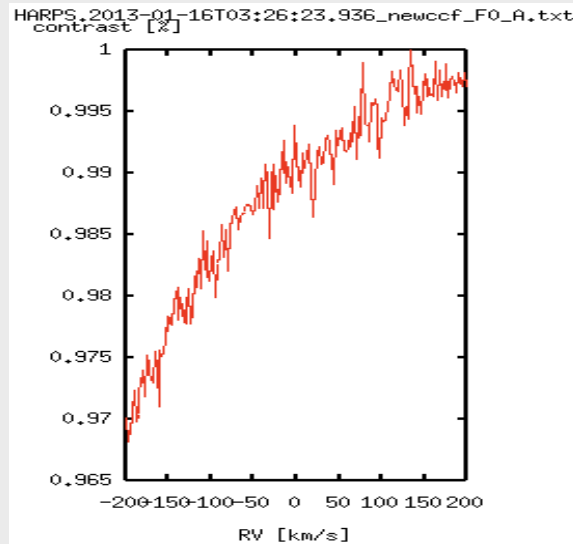
14 known CoRoT planets with RV data over more than 2 years

- CoRoT-24 RV show a long term curvature.

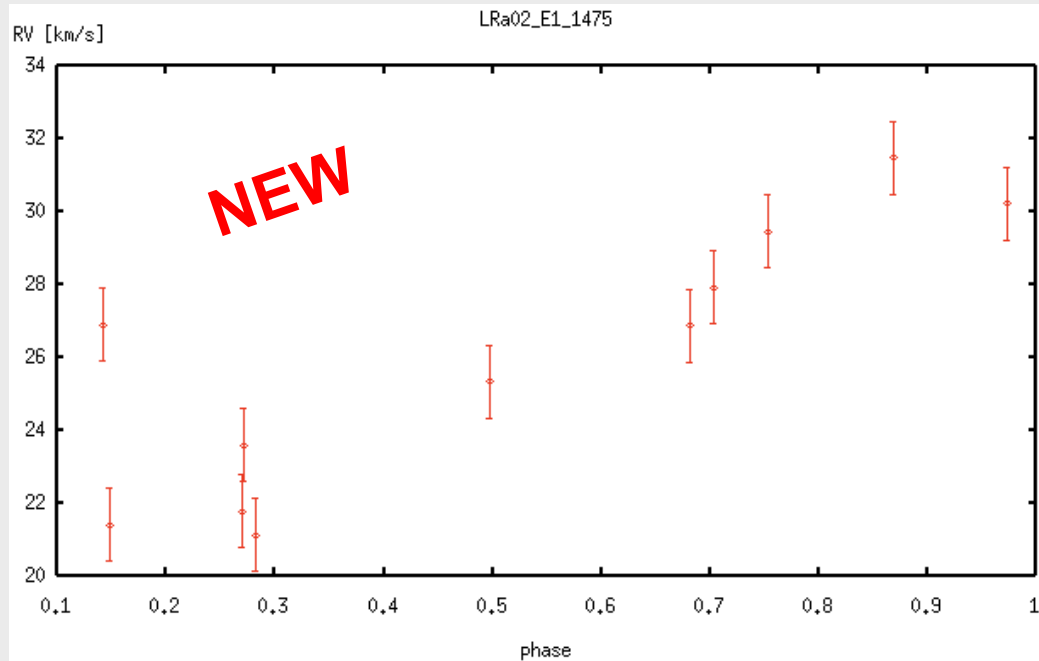


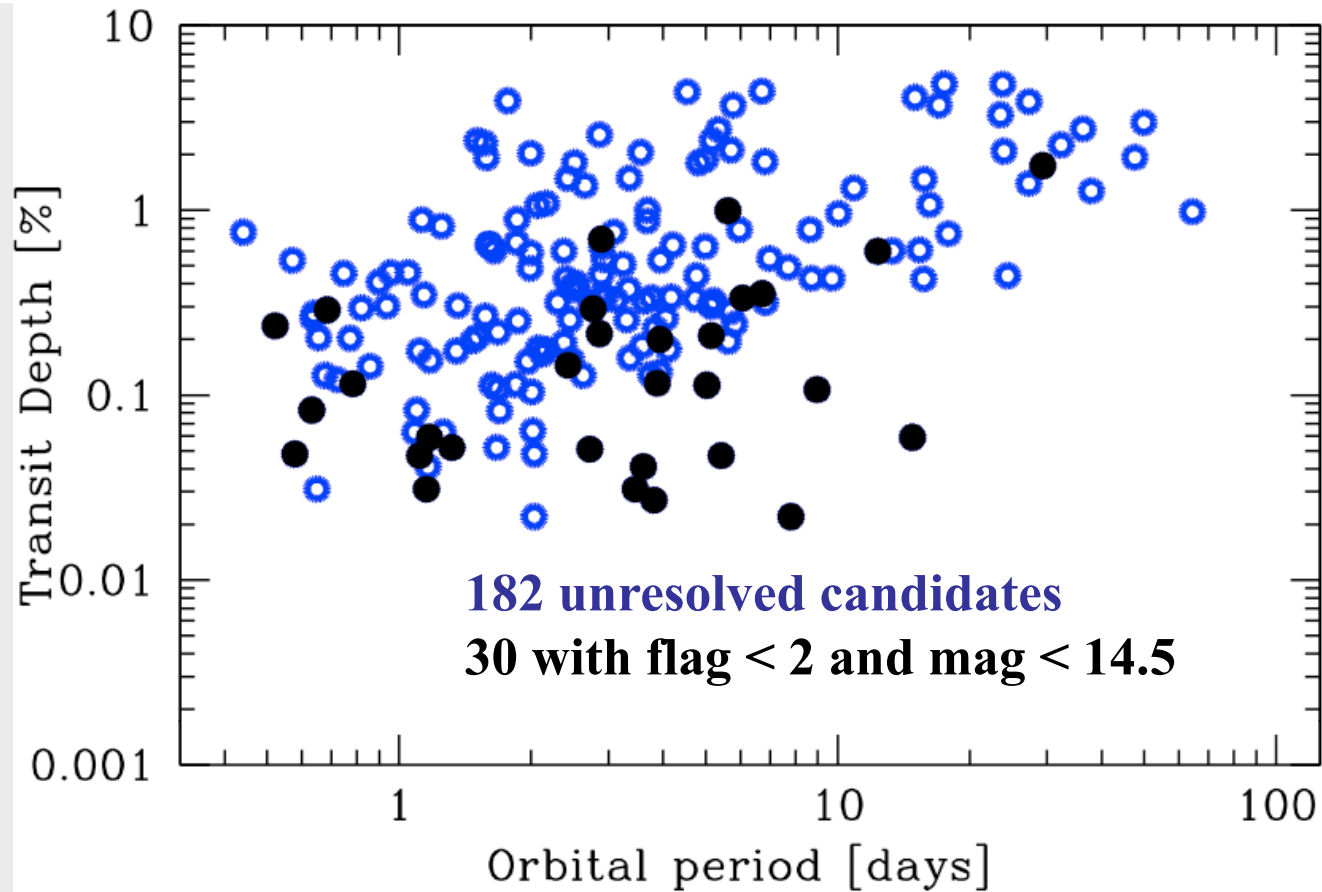
Improvement of orbital parameters of CoRoT-20b (*Deleuil et al. 2011*)
+ new solution for the second companion CoRoT-20c

A new transiting Brown Dwarf orbiting a A-type star



M~60 Mjup
P=2.1 day

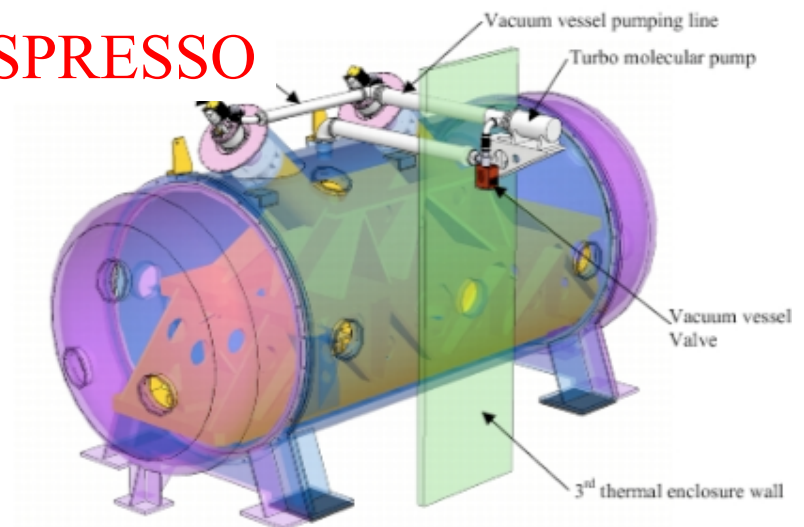


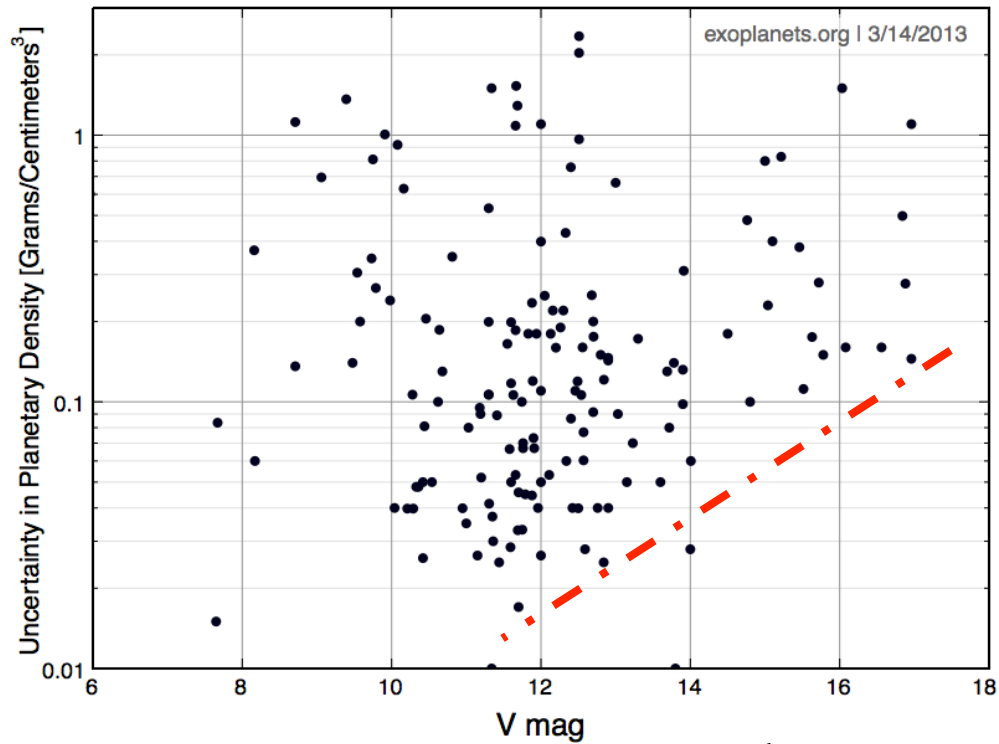


Next step

- Identify best remaining candidates
- Validate planets with PASTIS
- Dedicated HARPS campaigns
- RV FU with ESPRESSO@VLT (2016)

ESPRESSO





Density uncertainty of transiting exoplanets

