Poster n. 4: Feasibility of mass determination for ARIEL targets

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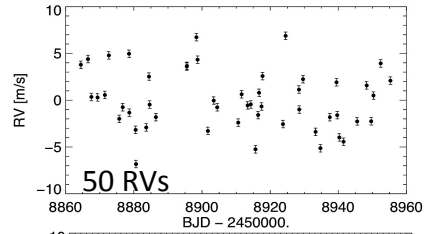
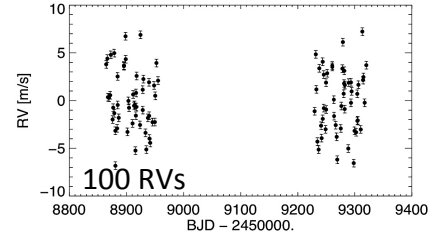
AIM: to quantify the telescope time needed to measure the planetary mass for a fraction of the ARIEL MRS (Edwards et al. 2019)

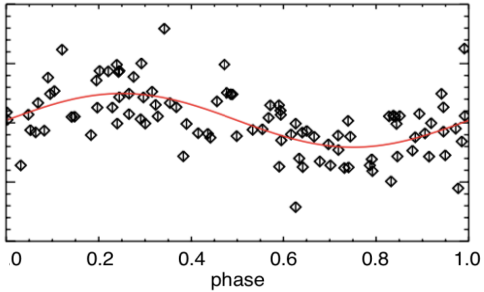
- low-mass planets (see Changeat et al. 2019)
- single spectrograph at 4-m class telescope (e.g. HARPS-N@TNG)
- 4 ranges of stellar masses, 3 ranges of stellar magnitudes (from which we obtained typical values of planet parameters)

Simulations of radial velocity (RV) time series:

- 50 RVs randomly spread over 90 days (+ additional 50 RVs)
- RV dispersion defined as in Cloutier et al. 2019
- Activity (P_{rot}=30d) + planetary signals injected as sinusoids

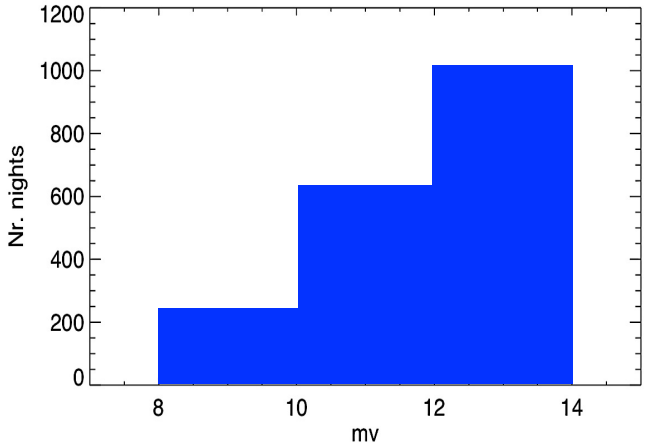






182 recovered planets

V mag	Nr. targets	Texp
[8. – 9.9]	77	15 min
[10. – 11.9]	68	30 min
[12. – 13.9]	37	60 min



The time required for an RV follow-up producing a robust mass estimation (**K ≥ 5σ**) of about half of the ARIEL MRS hosting a low-mass planet with mv < 14, is about 1000 observing nights, 642 if we consider the brighter targets only (mv < 12).

WORK IN PROGRESS!

- the improvement of the RV sampling (more realistic monitoring, target coordinates)
- a larger exploration of the stellar and planetary parameters
- the use of more and/or larger telescopes
- …

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