HALO workshop

Discussion

Models

- Attract and support community working on line lists
- Benchmark spectra, developing an exoplanet climate database
- Identification of key cases for predictions and guide developments of future instruments
- Intercomparison between databases and models
- Predictions for polarization, polarized spectra
- Limitations of current models, lines of development

Needs in models

- How to fill in the gap of knowledge about atmospheric origins?
- Can we tell if an atmosphere is primary or secondary? Related question: can we get to know if the host star was a fast rotator?
- More modeling of climate and stars to fill in the gap of knowledge between theory (star+climate) vs observations & instruments?
- Link between funding strategies and biosignatures overselling

Sample

- How HWO-LIFE sample are going to change in time ?
- Are there enough target for HWO + LIFE + …?
- Mamjeck's paper —> should we double check ??
- Slow vs fast rotator ? Sun ? Sample of GHWO / What is the age distribution of the sample
- Rules for the target list ? Earth like planet only ? Risk to do a short cut (cf Franck's talk)
- What are the most interesting targets ? Hosts ? Priorities ?
- Should HWO focus on planets that are not telluric, not habitable ? Is it a science case for 1st generation instrument
- What about boring planets ?
- Hycean planets ?
- Priority targets are nearby, with large proper motion. Can we look now at the region they will be in ~20 yrs, to detect background parasite objects

Precursor surveys

- EPRV prospects and strategy, (inter)national coordination
- Beyond RV: interferometry, astrometry, stellar properties, exozodi, dust mineralogy, …
- Population-level demographics/statistics: μlensing
- Instrumental development for prep surveys:
  - Astrometry mission beyond Gaia
  - NIR velocimeters on 8-m telescopes (VLT2030-2)
  - Multiplexing for EPRV (fiber bundles, photonic lanterns, DMDs)

Instrumentation & observation limits & complementarities

- Instrumentation & observation limits: How far are we from the fundamental limits of current techniques (inc. target population)?
- Instrumentation improvement: What is the best trade-off to get more information/improve fit with models? Increase exposure time/polarization/new wavelength coverage/higher spectral resolution?
- Complementarities between instruments: Final performance (SNR) of HWO and PCS, Impact of phased or unphased observations?

Detection and beyond

- Detection versus characterization: which one is better (for instance for HWO?)
- Individual targets versus population: from individual characterization to statistical analysis?
- Costs: how can we estimate the human and computational efforts?

HWO, LIFE, intermediate mission concept

- Ground-based follow-up as part of future large space missions
- Single facility that does HWO & LIFE

Organization, structuration of the community

Karma law: remember that your actions of today will determine how happy your next LIFE will be

- What to do as a community to have both HWO & LIFE
  - role of ASHRA , other coordination
  - ability to efficiently use possible application
- How to maintain and feed an active community on the long term
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- Common language between different communities
- Making sure about the appropriate communication: towards agencies, inter-communities (SFE), “grand public”
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- France within European scale
- Preparing wrt ESA
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Involvement into LIFE

- Practical way to be involved and take value of on-going activity for LIFE
  - to what level, what timescale, what topics ?
  - how ?
- Part of HWO methodo or momentum to be used/applied for LIFE ?

HWO

- How open Is French HWO-team ?
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- How to make sure the expertise in France is
  - well identified by NASA, by agencies
  - stimulated on the right aspects ?
  - Position on scale of instrument / part / specific expertise
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- Specific priorities on HW development
  - detectors: precise the need and potential European/French contribution
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Other missions ?

- relation to ground
  - in parallel to effort on ELT
  - post ELT prospects ?
- space :
  - other less ambition/simpler: complementary (not distracting main goal)

Data challenge and SW-model development

- Organizing a data challenge ?
  - algo
  - instrumental setup
  - astronomical info retrieval capability
- Specific attention on phase curve
- Need to improve the question of atmo info extraction (degeneracies, complementarity…)
- Detection algorithm