PLATO Sweden meeting, 2025 May 26

Albano Building 2
Lärosal 13

Time	Duration	What	
09:30	10	Meeting starts	
09:40	30+15	Anders Erikson	*Current Status of PLATO*
10:25	15+5	Alexis Brandeker	*Swedish hardware contributions to PLATO*
10:45	30	Fika	
11:15	15+5	Markus Janson	*High-resolution imaging for PLATO*
11:35	15+5	Nikki Miller	*The MSteSci1 pipeline for characterising M-dwarfs in the PLATO sample*
11:55	15+5	Dainis Dravins	*Challenges for ultra-precise radial velocities*
12:15	85	Lunch	
13:40	15+5	Jérôme Bétrisey	*Seismic inversions: a sophisticated method for stellar characterisation in PLATO*
14:00	15+5	Oleg Kochukhov	*Stellar science calibration and validation for PLATO*
14:20	15+5	Melvyn Davies	*The Influence of Birth Environment on Planetary Systems*
14:40	15+5	Alex Mustill	*Transits of WDs with PLATO*
15:00	30	Fika	
15:30	15+5	Jayshil Patel	*Observing exoplanet atmospheres in PLATO era*
15:50	15+5	Carina Persson	*Is the Solar System common?*
16:10	50	Summarising discussion, outlook	
17:00		End of meeting	

Anders Erikson (DLR): *Current status of PLATO*

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Alexis Brandeker (SU): *Swedish hardware contributions to PLATO*

I will present the design and production of the F-TOU filters that were the Swedish hardware contribution to PLATO.

Markus Janson (SU): *High-resolution imaging for PLATO*

I will summarize the high-resolution imaging efforts associated with the ground operations program for PLATO, and how it helps both the candidate vetting and the scientific program.

Nikki Miller (UU): *The MSteSci1 pipeline for characterising M-dwarfs in the PLATO sample*

I will present work on adapting the PLATO MSteSci1 stellar analysis pipeline module for application to M-dwarfs (P4 sample).

Dainis Dravins (LU): *Challenges for ultra-precise radial velocities*

The detection of Earth-like planets in Earth-like orbits around Sun-like stars is (no longer) limited by instrumental performance but rather by intrinsic stellar variability. Evolving atmospheric inhomogeneities and velocity fields induce “noise” in both photometry and apparent stellar radial velocities that overwhelm the tiny signal expected from an exoEarth (annual modulation 10 cm/s). Confirmation of Earth-like planet candidates likely requires radial velocities. In our PSVWG (PLATO Stellar Variability Working Group), we are concerned with how to segregate such stellar “noise”. Efforts concern both trying to find algorithms for the optimal extraction of radial-velocity information from measured spectra, and trying to understand what spectral-line parameters ideally should be measured in the future.

Jérôme Bétrisey (UU): *Seismic inversions: a sophisticated method for stellar characterisation in PLATO*

This presentation provides an overview of PSM WP 124200 (Inverse Methods) within the PLATO mission. By observing acoustic oscillations, PLATO aims to determine fundamental stellar parameters such as mass, radius, age, and mean density with exceptional precision and accuracy. These accurate stellar models are essential for understanding planetary system evolution and tracing the history of our galaxy through Galactic archaeology. While grid-based inferences have demonstrated very good performances, they do not perfectly reproduce the observed oscillation frequencies. Seismic inversions are advanced techniques that exploit these frequency discrepancies to extract additional insights from the frequency spectrum. They serve as a valuable complement to grid-based inferences, enabling more accurate and comprehensive stellar characterisations.

Oleg Kochukhov (UU): *Stellar science calibration and validation for PLATO*

The Science Calibration and Validation (SCV) team within the PLATO consortium plans to observe a large number of targets other than the core PLATO targets. This effort is essential for refining our

understanding of key stellar physics processes and improving the characterisation of instrumental effects in PLATO light curves. In this presentation, we will highlight the Swedish contribution to SCV, focusing on the development of a catalog of constant and regularly varying targets in the PLATO long-duration observation fields. This catalog will serve as a valuable reference for the long-term calibration of PLATO light curves, ensuring high-accuracy photometric measurements throughout the mission.

Melvyn Davies (LU): *The Influence of Birth Environment on Planetary Systems*

I discuss the consequences of birth environment on the formation and dynamical evolution of planetary systems.

Alexander Mustill (LU): *Transits of WDs with PLATO*

A handful of WDs have now been found to show transits of planets, disintegrating planetesimals, or asymmetric ring structures. What are the prospects for further study of these objects and possible discoveries of more with PLATO?

Jayshil Patel (SU): *Observing exoplanet atmospheres in PLATO era*

PLATO, with its ultra-high-precision photometric observations, will provide a unique opportunity to study exoplanetary atmospheres in depth. It is important to test what kind of atmospheric features are likely to be detected with PLATO. Several groups in the PLATO community are actively working towards testing the feasibility of PLATO in studying exoplanetary atmospheres. I will discuss the activities of the phase curve working group and 3D climate work package in this regard.

Carina Persson (Chalmers): *Is the Solar System common?*

To date, no detected exoplanet system resembles our own. Most multi-planet systems have so far been detected with Kepler and display a compact architecture with similar planet sizes and masses, and regular spacing in nearly circular and coplanar orbits (”peas-in-a-pod” systems). The architecture of systems with both inner small, short-period planets and long-period giants is so far not well known due to observational biases and challenges with very few resulting characterised systems. A combination of transit photometry with Plato and follow-up radial velocity measurements promises exploration of different types of exoplanet systems.