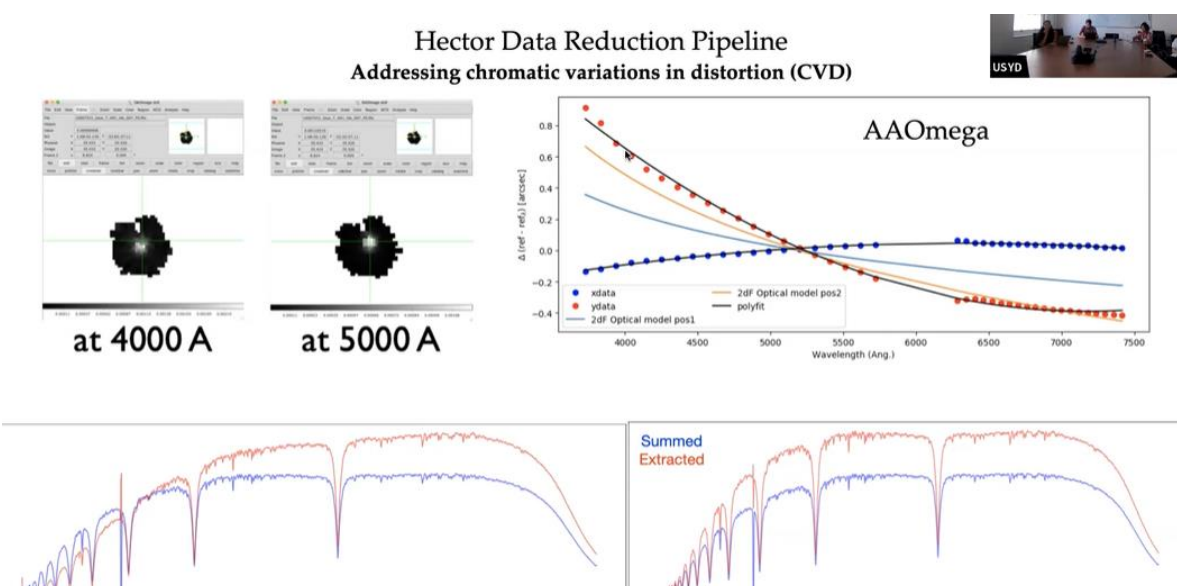**HECTOR SCIENCE MEETING**

WEDNESDAY 8 MARCH2023, 3.00 – 4.00PM

Zoom – the meeting was recording for minute taking purposes only.

Attendees:, Julia Bryant (Chair) Sree Oh, Matt Owers, Stefania Barsanti, Gabriella Quattropani, Joon Hyeop Lee, Hyunjin Jeong, Amelia Fraser-McKelvie, Henry Zovaro, Marie Partridge, Jiwon Chung, Madusha Gunawardhana, Oguzhan Cakir, Jesse van de Sande, Di Wang, Brent Groves, Pablo Corcho Caballero

Apologies:, Luca Cortese, Sam Vaughan, Angel Lopez-Sanchez, Caroline Foster,

Item	
1	**Action Items from the previous meeting (14 February 2023)** • Have all been addressed
2	**Observer Coordination - Stefania** • Stefania has sent emails for: ○ 2df observers – both lead and experienced observers. Observing is underway. ○ Hector still has slots free, but there has been a good response. • Stefania will send out the links with organisational information including accommodation booking and visitors forms. The staff at Siding Springs have requested that these are completed in good time before arriving for an observing run to make the preparation by site staff easier.. • Julia and Stefania, thanked those who have signed up and also those who have been volunteered to be trained, but encouraged others to sign up, especially those who have already been trained (there is limited availability for those requiring training). • This role with move to the Hector Expert Observer role once they are appointed. Interviews are currently taking place. <mark>**Action Items:**</mark> • Observers are asked to book accommodation at SSO in good time.
3	**Data Reduction (DR) Update – Sree** • Have been working on improving the cubes and have overseen the changes being made. • New data will be generated in April so it will be helpful to have the new cubes available from this data. • Hector Busy week is likely to take place from 22 – 24 May as other weeks were already blocked. Venue TBA depending on room availability, but likely to be in Sydney, team members will be required to assist with the organisation. In the future the location will move to different states, ideally combing with other projects eg WAVES. • There was a Hector DR meeting on 7 March which tackled some issues with the pipeline and also discussed the flux calibration, the cause of this issue has been identified (it related to the chromatic variation distortion). In ccd1 the blue wavelengths the standard star does not sit in the centre of the cube, but in the red wavelengths it sits in the centre, so there is a change in the centering of the stars according to the wavelengths. Madusha is looking at 2 methods to address this. **Slide - Addressing Chromatic Variations in Distortion (CVD) – Madusha**

- AAOmega – Using the SAMI date reduction code
- The 2 plots at the top left show the cube images. The central position changes with wavelength and also depends on the placement of the hexabundle on the field plate.
- The plot on the top right shows a primary standard star at a given position on the plate and shows how the central position changes with wavelength. In the previous set of cubes this wasn't taken into account, so when the flux was extracted, flux was lost.
- The bottom left plot shows the extracted flux in red with no corrections. On the right shows the flux is higher after applying the correction.
- These plots have also been mapped for Spector data again showing that it is not just a wavelength effect, but also a position effect of the hexabundles on the field plate.
- Primary standard stars and secondary standard stars will be used to get a rough CVD correction for the data cubes, but ultimately this will be mapped across the plate which will require some calibration data from the April run.
- By May data will be available to run a more accurate correction.
- This issue needs to be addressed before releasing the next version of the cubes to the team.

Other aspects to consider:
- When using the guider to centre a field it is not set to a specific wavelength. A filter could be added to the guider for a specific wavelength, however there is no correct wavelength to guide at. Using filters does reduce the magnitude range that is available for guide stars. There is a tendency to put red in the centre.
- The stretch being seen in the guide stars as they are elongated towards the edges of the 2df field. This is caused by the 2df optics. Sree will reduce the data from Spector this week.
- These effects have not been seen before at the 2df top end and this effect could not be measured as 2df is a single fibre. The 2df correction was added by the Zemax modelling, so it is theoretical and has not been tested. With Hector there is a larger stretch which is greater than that predicted with the Zemax modelling especially at the edge of the field plate. There is a change with time, but this should be a small second order effect. Taking multiple star fields and mapping across the plate very accurately should address this issue of CVD stability. The issue is the chromatic effects of the optic not the atmosphere.

Slide 2 - Testing the arc reduction and the flats – Pablo
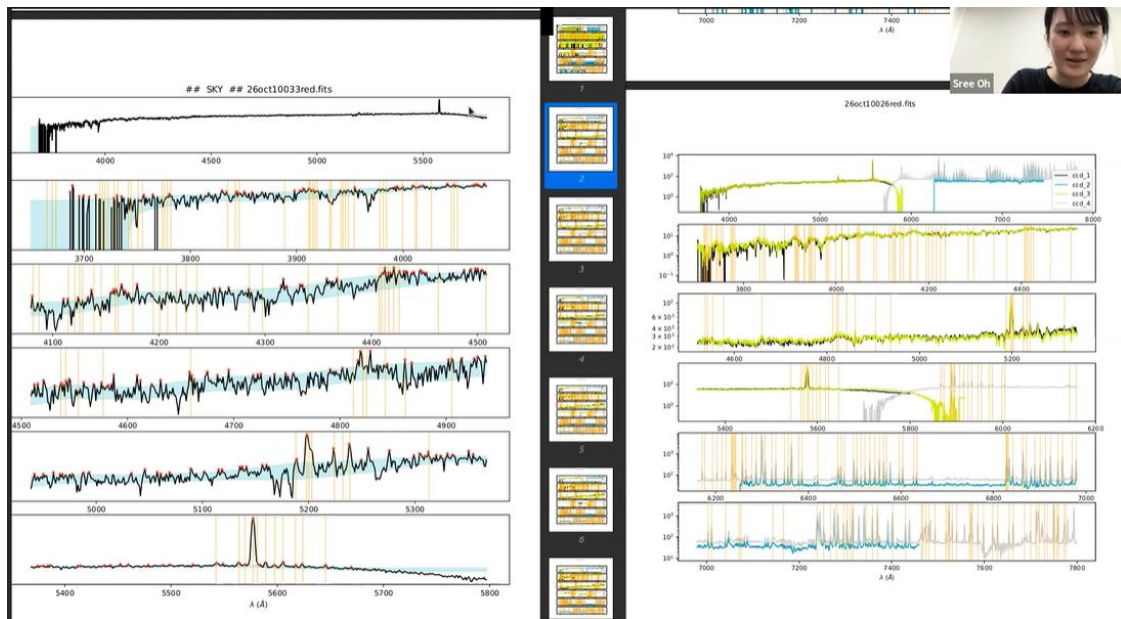
- Testing the accuracy of the wavelength calibration just using the sky spectra (combination of the sky bundles. Using a set of lines form an ESO catalogue so that there are plenty of emission lines, filtering to get the brightest. Using more than 300 emission lines. In the blue you can only rely on 3 or 4 – not just 5577.). The next is to design a report to track this with all the observations. There are 2 possible designs:
- On the left is a report every single file for each ccd, some of the lines compared to the theoretical location of some of the sky (shown in orange)
- On the right hand side is a comparison of the 4 ccds for a single object where you can see the whole spectrum and the location of the emission lines.
- The accuracy is less than 1 Armstrong
- Testing will start for each fibre, this may uncover issues. The accuracy is excellent when using all the fibres.

Other DR Updates
- Susie finished adjusting the cube sizes and Tom tested the cubes. Stefania has just finished testing the cube sizes. The code is ready to be implemented in the new version pipeline.
- Sam has discussed the server at Data Central as this will be more effective for accessing information rather than moving and sharing the file.
- Sree is currently developing more DR tasks.
- Henry added that the changes to the python package appear to have fixed the multiprocessing issue.

	 • Contact Sree if you are interested in working on some of the new DR tasks. • Sree to email Henry about the update to the python package and will continue testing.
4	**Tiling Update** • Sam is an apology for today's meeting, • Sam will circulate the slides he has produced for the new tiling once he returns from leave.
5	**Hector Expert Observer** • The person appointed will be trained in April. Following this they will be present at the start of each observing run and will be an expert on both the Hector instrument and observing. • They will not be able to complete long runs but will take the pressure off other trained observers. •
6	**Other Business** **New Guider** • The new guider will be ready for the next run and will be installed in April. **Hector Observing Proposals** • The next observing proposal is due soon. The reserve time proposal is due w/c 13 March. The allocation of nights should be similar to the last semester.
	The next Hector Science meeting is scheduled for Tuesday 11 April 2023, 3 - 4pm AEST **Meetings will continue alternately on the 2nd Tue and Wed of each month at 3 - 4pm AEST (1 – 2pm AWST).**