HECTOR SCIENCE MEETING

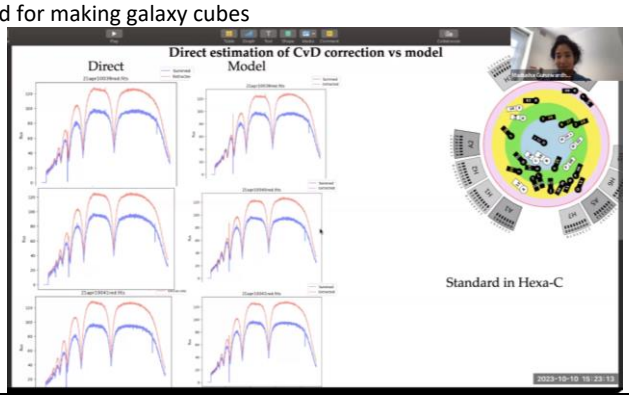
TUESDAY 10 OCTOBER 2023, 3.00 – 4.00PM

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

Attendees: Julia Bryant (Chair), Marie Partridge, Madusha Gunawardhana, Oguzhan Cakir, Joon Hyeop Lee, Pablo Corcho Caballero, Jong Chul Lee, Hyunjin Jeong, Gabriella Quattropani, Sam Vaughan, Stafania Barsanti, Sarah Sweet, Matt Owers, Sree Oh, Brent Groves, Henry Zovaro, Georgia Hartzenberg, Pratyush Kumar Das, Jiwon Chung

Apologies:, Jesse van de Sande

Item	
1	**Action Items from the previous meeting (8 August 2023)** **Hector Busy Week** • Julia emailed the team with the dates for Hector Busy Week (5 – 8 Feb 2024) in order to plan the content early. **Morphology Classification Scheme** • Mina had contacted Data Central however unsure of progress in approaching Kenji Bekki to discuss if AI may be of assistance for the classification process. Carry over item to next meeting. • It was noted that DECaLS have done a data release with machine learning. This could be checked to ensure it matches with Matt's cluster catalogue and used to reduce the number of hours to complete this task versus manual classification. **QC Summary** • Pratyush volunteered for the task of examining the transmission estimations.

2	**DR Update (Sree)**
	• Sree gave an update on the DR meeting that took place this morning.
	• Sree has generally had to make some manual changes on each observing run. For example:
	1. There is a different tile name from the file name and Plate ID naming - if an observer realises that they have made a mistake naming the Standard Star they need to run the following code to correct the issue
	1. Mis answer when the manager asked about whether the frame is standard star frames
	`In [4]: mngr.update_name(['06mar10003', '06mar20003'], 'EG274')`
	`In [4]: mngr.update_spectrophotometric(['06mar10003', '06mar20003'], True)`
	The above makes `06mar10003` and `06mar20003` be considered as standard star frames and change their name to be 'EG274'
	2. A twilight flat was taken as an object frame, requiring a change to the NDF_Class header
	3. A tramline failure due to mispositioning of a sky fibre requiring visual conformation or a change in the fibre table.
	• Sree has included these issues in the observing manual and asks for manual issues under points 2 & 3 above are flagged to the DR team prior to the file being reduced.
	• There was a swap between the B & T hexabundles, this has only occurred on one occasion. Generally if one person plugs the plate and the other person checks the plugging, this will eliminate most issues with errors. It was suggested that the buttons on the plate be labelled more clearly so that manual cross checking could be done, however this was done originally and is less efficient that visually plugging the plate by pattern matching.
	• Henry confirmed the plate figure, does not need improvement to make it more readable as many suggestions have been implemented.
	• The run leads have a check list after finishing plugging which is included in the observing manual.
	• Pratyush has improved the mngr.import_aat which now imports all data from an observing run (not just each single day). This will be tested during the next observing run.
	CVD Modelling (Madusha)
	• The direct method only works if actually observing stars. The new model works well and is already included in the DR pipeline and will be used for making galaxy cubes
	 

	Red = extracted spectrum; Blue = directly summed spectrum. The extracted spectrum needs to be higher value than the summed spectrum and should be above the blue line. As more stellar data comes in this will be improved further. • There have been 887 data cubes produced since Oct 2022 which can be used for science. New data cubes with the updated CVD modelling method will be circulated soon and will also include the naming and the rotation of the cubes. • Stellar kinematics and emission line data are being worked on currently. • Team members are encouraged to look at the data as this will also help to identify further issues. **Action Items:** • Sree will ask Tom W to check that all data from each observing run is being imported during the next run. • Julia will check that the check list after finishing plugging is included in the observing manual.
3	**Multi Component Fitting (Gabby) –** please refer to the attached slides. • Mina identified the following galaxy as of interest as there were some asymmetries in the data. Slide 2 – Right = component map. Blue = one component fit, Red = 2 component fits. Contours = the stellar continuum. Slide 3 – 2 component fit from the central spaxel. Right hand plot confirms it required a 2 component fit and has values for dispersion velocity etc. Slide 4 – Colour maps. Note: All the maps were made with a signal to noise ratio of both Hα and NII ≥ 3 Slide 5 – Component maps. The top plot is a 1 component. Bottom plot shows 2 component fits separated by component 1 (left) and component 2 (right) ordered by velocity dispersion. Component 1 fits smoothly in to the top plot. Slide 6 – Velocity Curve. Similar to the Component maps. Slide 7 – Dispersion map – the smooth fit can also clearly be seen. Slide 8 – S/N ratio of all BPT lines ≥ 3. The variation in C1 can be seen as you go across into the composite lines. • Gabby not only completed the emission lines but also completed the stellar kinematics etc in order to generate the plots shown. • Gabby also has the emission line data and kinematic data if others want to look at it. Discussion points: • Gabby will investigate if there are velocity residuals once the rotation velocity gradient is removed. • Regularisation is not included, this may be assisted as it is an AGN potentially correlates things spatially • The decision regarding how many components to keep in each spaxel is being made using Bayesian Information criteria the minus 10 threshold in the future machine learning may be useful. Currently it is effective just using spaxels. • The outputs of the pipeline have been following SAMI as closely as possible. Henry and Gabby will discuss the inputs required by Spaxelsleuth. • The spectra were binned to produce a high enough signal to noise ratio to determine an optimal template from the XShooter templates. Gabby hasn't tried binning up, but would there be sufficient signal to noise ratio if everything was summed in that component to locate that on the BPT diagram. This will be discussed with the DR team to see if the binning can be included in the pipeline. • Lack of signal to noise ratio at the outer spaxels could bias the map of the 2 components. There was a S/N cut so it can be assumed that you can trust the 1 component fits and also there was checking of error of elements like the velocity and dispersions of the components and signals, so the data should be reliable. **Action Items:** • Julia will liaise with Gabby in order to include a plot in the upcoming observing proposal submission. • Henry and Gabby to discuss the requirements to run the data through Spaxelsleuth.
4	**Other Business** Observing Proposal Update • The reserve time proposal has been submitted and the shared time proposal will be submitted soon. • Those who are involved in the updated proposal will receive a copy, however if any person who should be included isn't notified, this is due to an issue with LENS not allowing some names to be uploaded. Data Central is aware of this and it will be rectified. **Observing Update** • Skys have been clear. The most recent run finished on 9 October and a couple of issues were experienced which have now been addressed. • The 3 actuators have all been replaced and recalibrated. • There are 2 long runs in November and December. There will be no observing in January and also February as AAOmega will be offline.
	The next Hector Science meeting is scheduled for Wed 8 November 2023, 3 - 4pm AEST **Meetings will continue alternately on the 2nd Tue and Wed of each month at 3 - 4pm AEST (1 – 2pm AWST).**