

SWG Chairs Telecon 15-Oct-2019

Notes by Evan Keane

Participants: Anna Nelles, Mark Sargent, Gianni Bernardi, Sarah Blyth, Andrei Mesinger

Apologies: Natasha Hurley-Walker, Doug Johnstone, Izaskun Jimenez-Sera, Eduard Kontar, Ann Mao, Garrelt Mellema, George Heald, Sebastien Muller, Francoise Combes, Divya Oberoi, Richard Battye, Grazia Umana, Laura Wolz

SKAO participants: Anna Bonaldi, Robert Braun, Philippa Hartley, Tyler Bourke, Jeff Wagg, Evan Keane

SDC2

RB provided update on SDC2 - focusing on HI emission and absorption ($z=0-6$ so including Mid and Low). Have been looking into statistical properties (stellar, star formation, dark matter) should be create a large sample with HI signatures. Using ALFALFA (30k spectra) for guidance. A subset has optically matched counterparts. Obtaining M^*-M_{HI} and SFR- M_{HI} dependence from this large sample. Density-dependent trends also evident.

Have also made dynamical mass measurements (using optical morphologies) and this relates to spectral line widths.

Have a new version of THINGS cubes, which has improved multi-resolution CLEAN applied. Preparing clean, masked versions of these. To be used as basis for simulations, with addition of extra variation in recession velocity, inclination etc.; that would be informed by ALFALFA sample. Result will be a large and diverse sample.

Realism: Will be adding in "residual" RFI features. Will have imperfect continuum subtraction.

SarahB: Will the mass distributions be based on semi-analytic models or simulations?

RB: Yes, $z=0$ HI mass function is taken from ALFALFA. Redshift evolution suggestions would be welcome. So far, we have adopted a M^* (not number) evolution to provide the observed Ω_{HI} evolution.

SarahB: SIMBA codes have an evolving HI mass function built in. Will ask amongst the SWG for input.

MarkS: How to account for spatial distribution due to a changing H_2/HI balance with z in centres of galaxies? Very difficult.

RB: No plans yet. Would be interested in any existing prescriptions for this.

MarkS: Will investigate. Might be simulation based.

SarahB: Would these be treated as blind HI cubes? Or any optical colours, magnitudes etc.

RB: There will be a distinct radio continuum product. Hadn't thought about optical data.

MarkS: Hadn't appreciated that. That is good.

RB: Also interested in how to make more interesting as a continuum challenge too.

GianniB: What are the approximate timelines for this?

RB: Realistically middle of next year for a release date. Originally thought we could do this faster. Effort needed to make more realistic, so that it is more useful.

AnnaB: There is a trade-off, e.g. adding in optical would increase time. Also, how often do we want to bombard the community with these challenges?

GianniB: From our SWG perspective I know our data/observer members are very busy right now so just wanted to understand when this would appear. The absorption case might have been considered as a secondary goal to know, so this will be interesting to see how this will go.

RB: Intentionally didn't want to replicate efforts made by EoR group.

Data Challenges Workshop at INAF

Anna reported on a 3-day workshop at IRA in Bologna. Organised like a school with lectures in data archiving, sharing, analysis, reproducibility. Have been using our SDC1 as the basis of a training activity. Mixture of data scientists, computing engineers and astronomers.

Very useful spin-off activity feeding into training the next generation. The SKA Comms team will have an article about this event in next issue of "Contact" (our new SKA magazine).

RB encouraged people to read and contribute to future issues

Upcoming Meetings

VLBI meeting this week at SKA HQ

OzSKA Mt Stromlo Nov

SKA Engineering + Ops Shanghai Nov

PHISCC 2020 Cagliari next May

AndreiM: There is a general 21-cm and EoR/CD, but it will be well represented by the SKA community.

<http://www.sixten-cfa.eu/event/next-generation-cosmology-with-next-generation-radio-telescopes-ii/>

If you know more people who are interested, please invite them to register by November 15th.

RB: we are refreshing our SWG co-chairs. Both EoR chairs will soon rotate. We are also in discussion with other prospective chairs that will be joining us. Welcome on board to Andrei.

Job Advert

EK mentioned imminent job advert for a 3-year postdoc at SKA HQ. 100% FTE research position in area of Fast Radio Bursts working with EK. Will appear in AAS, swg-all etc. soon.

AOB

GianniB: Recent meeting in Montréal last year discussing EDGES signal. New system deployed confirms (!) the signal. 1 year after the result the debate is still ongoing.

GianniB: Some results in a paper appearing last week.

AndreiM: Some general updates are that we are continuing to work on a Theory/Interpretation Challenge. The goal of this is to infer the properties of the underlying EoR/CD sources blindly, using the 21-cm power spectrum from other groups (not generated in-house). We hope to formalize the format of the challenge in the next couple of months, but we already have some preliminary (mixed) results obtained by international SKA collaborations, which broadly speaking suggest that blind recovery works, but has large errors (likely driven by different source parameterizations). We are continuing to understand these preliminary results.

The other theory activities are still quite preliminary, so maybe it would be best to update on them at a later time.

On the observational side, Gianni mentioned the global signal workshop in Montreal <http://www.physics.mcgill.ca/global21cm2019/>

that included a lot of discussion on the EDGES signal; in particular there was this very nice analysis paper suggesting that including calibration errors in the forward modeling is very important too: <http://arxiv.org/abs/1910.03165>

AnnaN: nothing in particular to report. Everyone quietly working on their various projects.

MarkS: Most people busy on various pathfinders. Several of us have been working on wrapping up the Band 6 contribution in the next few days. Some of our members are at the VLBI meeting. Trying to plan our next SWG meetings, back to back with continuum science meetings. SPARCS coordinators have asked if there is a plan for an SKA science meeting next Autumn or not?

RB: held off from broadly announcing this as we haven't had confirmation of a venue, the timing is closely linked to this. Looking at vicinity of Cape Town next September but do not have confirmation. Hoping to have that within days, and then would announce widely, but waiting until then.

MarkS: Would be great to coordinate our meeting and SPARCS with that. Will wait to hear. Have been using the SDC1 codes on new data with different structured sources. Will update on the results soon.

SarahB: a lot of work on data from pathfinders. WALLABY and MIGHTEE data is flowing. Apertif HI surveys have started also. Our annual HI pathfinder meeting next year in May in Sardinia. Will have an SWG meeting attached to this.

AndreiM: nice paper from MWA group with EoR upper limits recently - currently the most competitive limits around <https://arxiv.org/abs/1909.00561>

ENDS