

SKA SWG Update 19 September 2023

Attending

SWG Co-Chairs: Abhirup Datta, Adriano Ingallinera, Andrei Messinger, Betsey Adams, Cherry Ng, Fernando Camilo, Jason Hessels, Natasha Hurley-Walker, Phil Edwards, Mark Sargent, Sebastien Muller, Marta Spinelli, Stijn Buitink, Tessa Vernstrom, Valentina Vacca

SKAO: Robert Braun, Wendy Williams (notes), Philippa Hartley, Tyler Bourke

Apologies: Divya Oberoi, Barbara Catinella, Stefano Camera, Francoise Combes, Aris Karastergiou

Low Station Layouts (Robert)

Mutual coupling in pseudo random layouts leads to resonances as well as extreme variability amongst embedded element patterns (EEP).

Vogel layout: eliminates shorter separations leading to less EEP variability and improved sensitivity especially < 100MHz.

But new EM simulations with fine frequency sampling do show resonances, especially near 125MHz at zenith.

An optimisation search suggests a perturbed Vogel layout shows best overall performance. Will seek to verify with measurements using perturbed AAVS3.

Jason: Are number of antennas and station size fixed - can we lose e.g. 5% of antennas to reduce mutual coupling?

RB: Station size is constrained, 38m is used in AAVS3, but this can and will very likely be stretched to 39m, but no more than this given construction contracts already let. Antenna numbers could be reduced, but simulations suggest perturbed Vogel should be very effective, so confirmation with adjusted AAVS3 will be key.

Abhi: Agrees dropping a few antennas may not be that bad. Or make them passive.

RB: It is possible that suitable subarray definition could allow modes with fewer active antennas per station to be tested, although this would need to be confirmed.

RB: A related point is that layout variability across the array is done by "rigid" rotation of each station layout including the antenna orientation.

Meetings

Natasha - MWA 10 yrs - future funding for MWA has been secured - focus on science into the SKA era, adding receivers, extending baselines - multiple Swiss institutes have joined MWA consortium.

Andrei - Fourth National SKA workshop in Catania, Sicily 27 Nov - 1 Dec.

Mark S - Swiss SKA days. Note this an open meeting and not just Swiss community. Swiss community also working on band 6 receivers and science case.

Tessa - Still finalising the exact date, but the next SPARCS Meeting will be hosted by INAF in Bologna Italy likely around first week of May 2024

Marta - SKA cosmology WG annual conference coming up, details TBC - note that this is different to the Swiss Cosmology meeting scheduled for March 2024.

Betsey - IAU GA - SKA HI science symposium.

Is there a plan to have something hosted by the SKA? Perhaps a SWG meeting attached to the meeting?

RB: There is indeed interest in organising such an event and a slot has been requested from the IAU GA LOC.

Tessa - Joint meeting of Magnetism and EoR SWGs next Tuesday

SWG chair issues

Request for Contact article suggestions (especially in the theory/simulations area) to Tyler B. Jason: I saw a recent talk on the FIRE2 simulations, and they were jaw dropping.
<https://wetzels.ucdavis.edu/fire-simulations/>

Refresh of SWG co-chairs is underway, in line with nominal term of appointments.

Investigation of centralised SWG wiki options (PH) is still ongoing.

Update of repository of SKA key documents (TB) is nearing completion and will soon go live.
-- request if there are specific docs anyone wants to let TB know

AOB

Fernando: MK call for proposals - review is done, 170 proposals - 4.3 times over-subscription.

RB: Plan to provide overview of construction progress next month.