

The SKAO logo is rendered in a bold, white, sans-serif font. The letter 'A' is stylized with a black starburst pattern inside it. The background of the entire slide is a composite image showing a night sky with a vibrant rainbow galaxy, a landscape of large satellite dishes in the foreground, and a dense array of smaller antennas in the distance.

SKAO

SKA SWG Update

Robert Braun, SKAO Science Director

19 September 2023

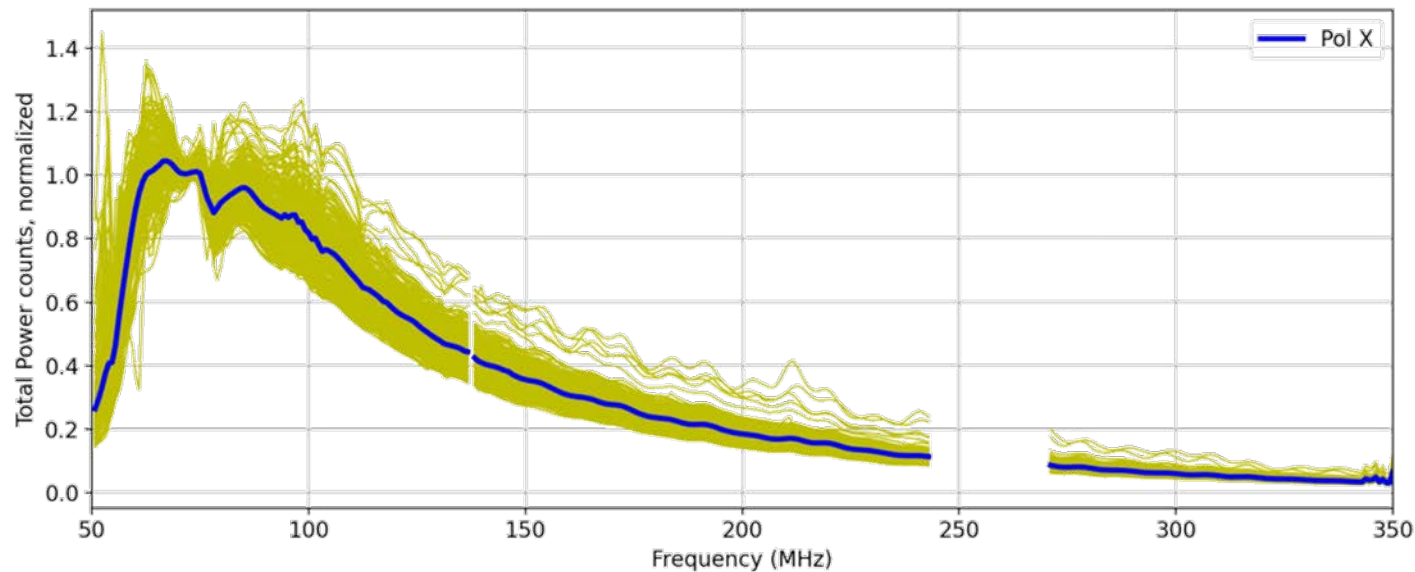
SKA Science Update

- SKA-Low Station Layouts
- Recent and upcoming meetings
- SWG Chairs Issues
- AOB



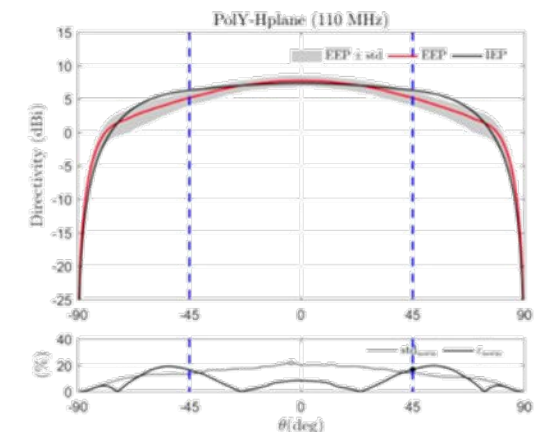
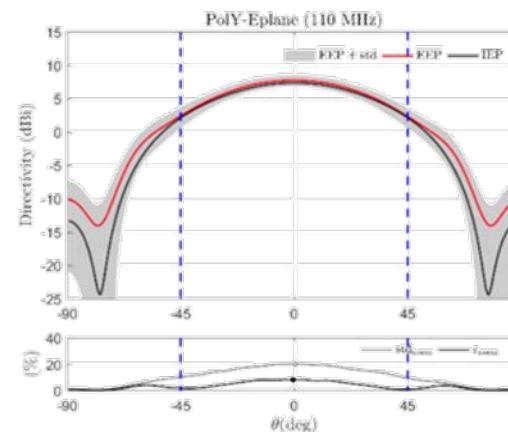
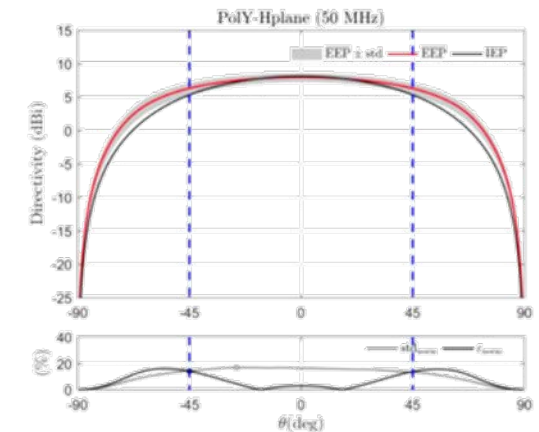
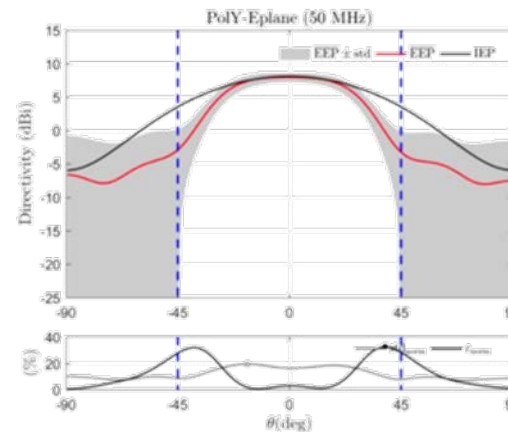
SKA Low Station Layouts

- Pseudo-random layouts used for AAVS1+2 stations showing resonance issues at 77 (and 55) MHz due to proximity of nearby antennas (R. Subrahmanyan, April 2021); minimum separation is < 1.3 m
- Concern since global Cosmic Dawn signature near 78 MHz



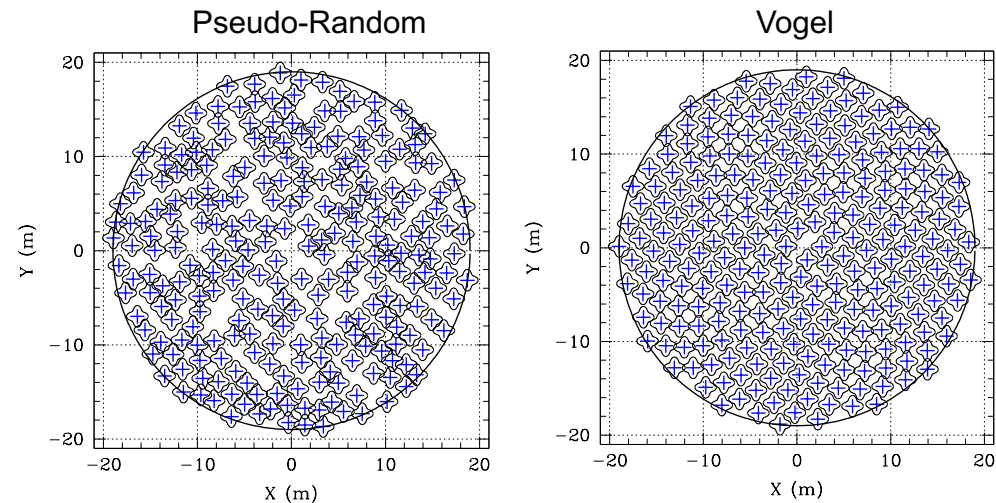
SKA Low Station Layouts

- Pseudo-random layouts used for AAVS1+2 stations showing great diversity of embedded element patterns below 100MHz (SKA-TEL-SKO-0001099, P. Bolli et al., April 2020)
- Possible complication for station calibration



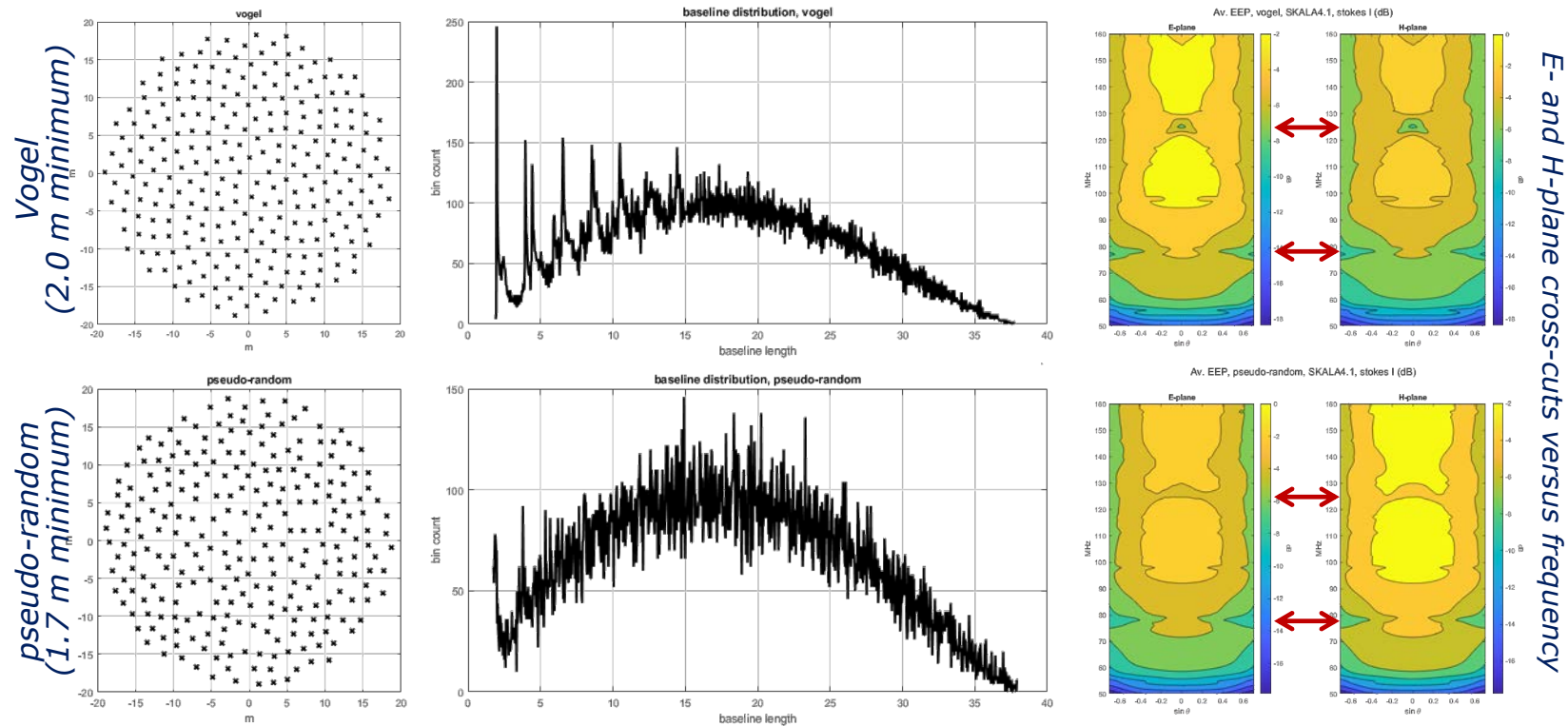
SKA Low Station Layouts

- Exploration of alternate station layouts underway
- Vogel (1979) layout defined by uniform areal density and maximal azimuthal diversity
- Eliminates close antenna pairs ($<1.3\text{m}$ to $>2\text{m}$) with strongest coupling effects
- Maximises station sensitivity below 100 MHz
- Vogel layout deployed in AAVS3 for on-sky testing



SKA Low Station Layouts

Layout analysis and optimisation by: De Lera Acedo, Gueuning, Anstey & Cumner



E- and H-plane cross-sections versus frequency

- However, peaked baseline histogram of Vogel (and even pseudo-random) yields some undesirable resonances at other frequencies, eg 125 MHz!



Science Meetings

- MWA: 10 Years of Ops, 25 – 28 July , Perth
- URSI GASS 2023, 19 – 26 August, New Facilities session, Sapporo (see next slide)
- SKA Swiss days, 6 – 8 September, Zurich (see next slides)
- Science at Low Frequencies IX, 11 – 15 Dec 2023, Amsterdam
- MeerKAT @ 5, 20 – 23 February 2024, Stellenbosch
- SKA Cosmology Conference, 18 – 22 March 2024, Lausanne, announcement soon! (see next slides)
- IAU GA, August 2024, Cape Town, various SKA Science events planned
- SKA Science Conference, Summer 2025, Germany, planning still to begin in earnest





URSI GASS 2023

August 19^(Sat)–26^(Sat), 2023 SAPPORO, JAPAN



Session J01 *New telescopes and major upgrades to existing telescopes*

(Di Li, Rob Beswick, Anna Bonaldi)

- 25 oral presentations selected covering a wide range of radio facilities
- SKAO was the most featured, with 4 oral contributions
 - SKA observing capabilities
 - SKA commissioning and verification plan
 - SKA regional centre development
 - Engineering operation planning for SKA-Low
- Also featured: ngVLA, next-generation Event Horizon Telescope, CMB-S4, ALMA, FAST, LOFAR, SDA-2000, Solar Submm Telescope, Sardinia Radio telescope, VLBI, etc.
- Well attended session, typically ~70 people at any time, including institute directors and senior specialists



SKA Swiss days

6 – 8 September 2023, University of Zurich, Switzerland

- A 3-day program including parallel sessions on:
 - SKAO and SKACH consortium updates
 - SKAO regional centres
 - SKACH science tools
 - Precursor science
 - SDC co-design
 - Data science and imaging
 - Mid Band 6 science and instrumentation
 - Astro science
 - Dark and quiet skies
 - SKA science data challenge
 - Data science and simulations



An excellent meeting with a lot of discussions and interactions!

Presentations slides at

<https://indico.skatelescope.org/event/1031/>



Cosmology in the Alps



18 – 22 March 2024, Les Diablerets, Switzerland

- The Cosmology in the Alps Conference will focus on radio cosmology studying the universe on large scales. It aims to bring together experts in the field together with junior researchers to foster interactions.
- If successful, the meeting will be held every two years
- In person only, 80-100 participants
- Invited and contributed talks, list of topics includes:
 1. Radio galaxy surveys
 2. Intensity mapping
 3. Gravitational Lensing / Cosmology
 4. Cosmic Dawn and the Epoch of Reionization
 5. Foregrounds and Magnetic Fields
 6. Instrumentation and current/future experiments
 7. Dark and Quiet Skies
 8. Diversity and Inclusion and Collaborating Across Borders



**First meeting announcement
to be circulated soon!**



SWG Chairs Issues

- Recent theory results or simulations for possible Contact article (observational results covered quite well recently)?
- Refresh of co-Chairs in progress in line with nominal term length ongoing
- Looking again at centralised SWG wiki options (Philippa)
- Updating SKA key document repository (Tyler)
- News from SWG Chairs?



Any Other Business

- ...



*We recognise and acknowledge the
Indigenous peoples and cultures that have
traditionally lived on the lands on which
our facilities are located.*

SKAO

www.skao.int