Square Kilometre Array Update

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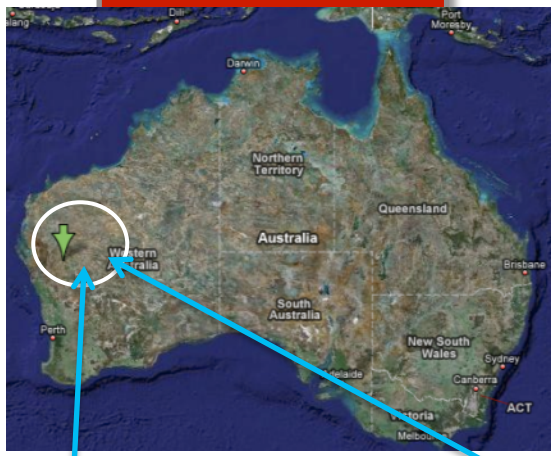
SKA Science Director
10th Sept 2013

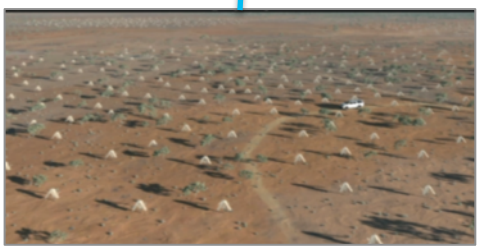
SKA Phase 1 (SKA1)
Cost €650M, construction start 2018

Southern Africa

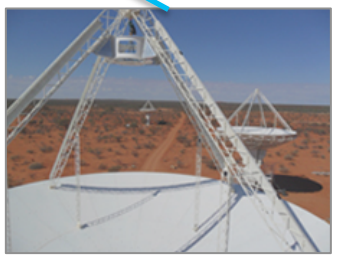
SKA1_MID
254 Dishes including:
64 x MeerKAT dishes
190 x SKA dishes

Australia





SKA1_LOW
Low Frequency Aperture Array Stations



SKA1_SURVEY
96 Dishes including:
36 x ASKAP
60 x SKA dishes

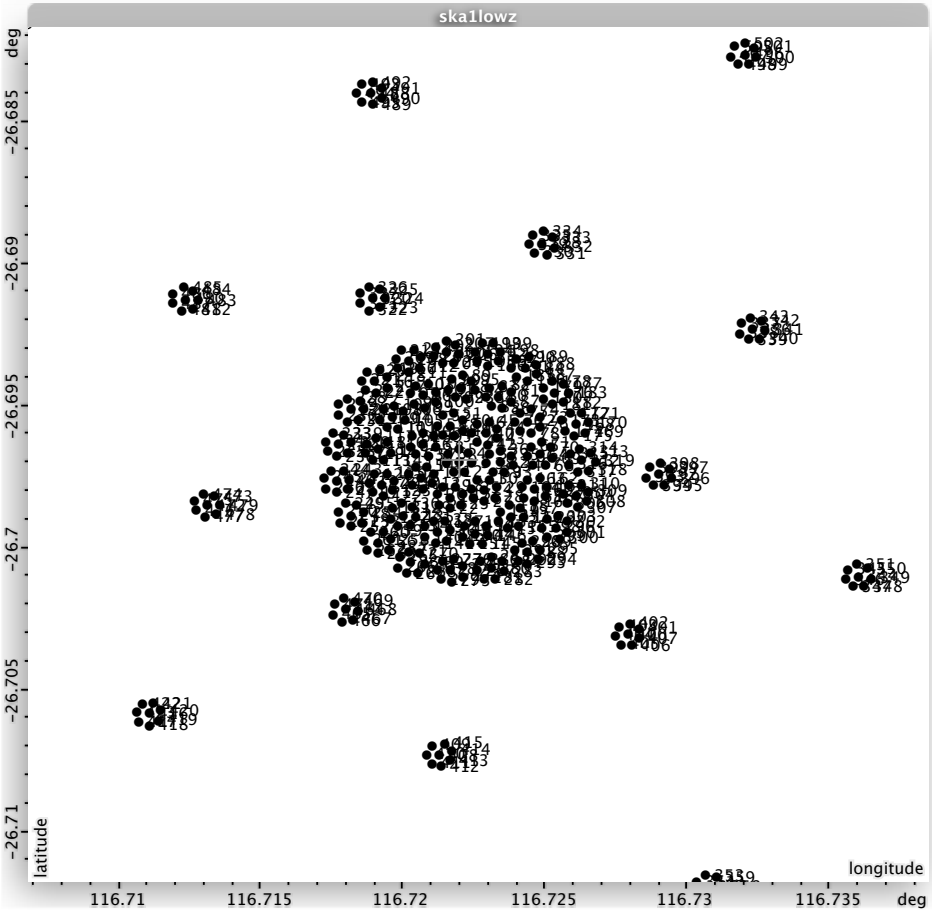
Exploring the Universe with the world's largest radio telescope

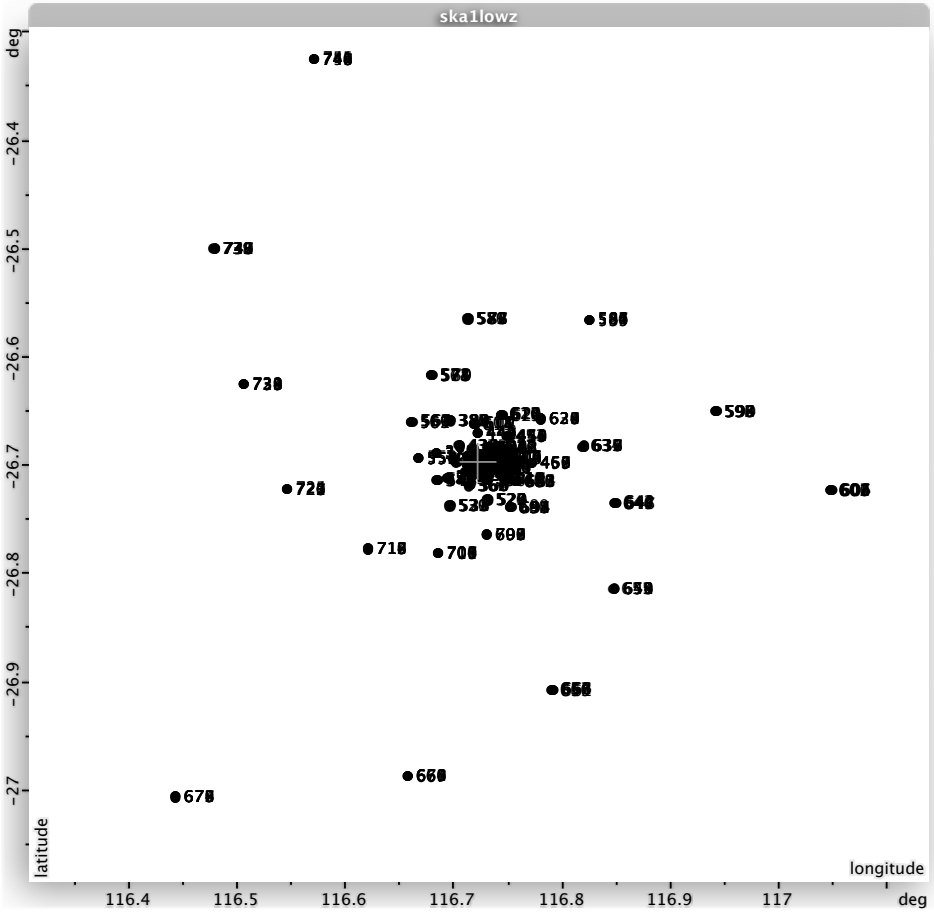
How does SKA1 baseline redefine state-of-art?

		JVLA	MeerKAT	SKA1-mid	ASKAP	SKA1-survey	LOFAR	SKA1-low
Aeff/Tsys	m^2/K	265	321	1630	65	391	61	1000
FoV	deg^2	0.25	0.86	0.49	30	18	14	27
Survey Speed FoM	$deg^2\ m^4\ K^{-2}$	1.76×10^4	8.86×10^4	1.30×10^6	1.27×10^5	2.75×10^6	5.21×10^4	2.70×10^7
Resolution	arcsec	1.4 - 44	11	0.22	7	0.9	5	11

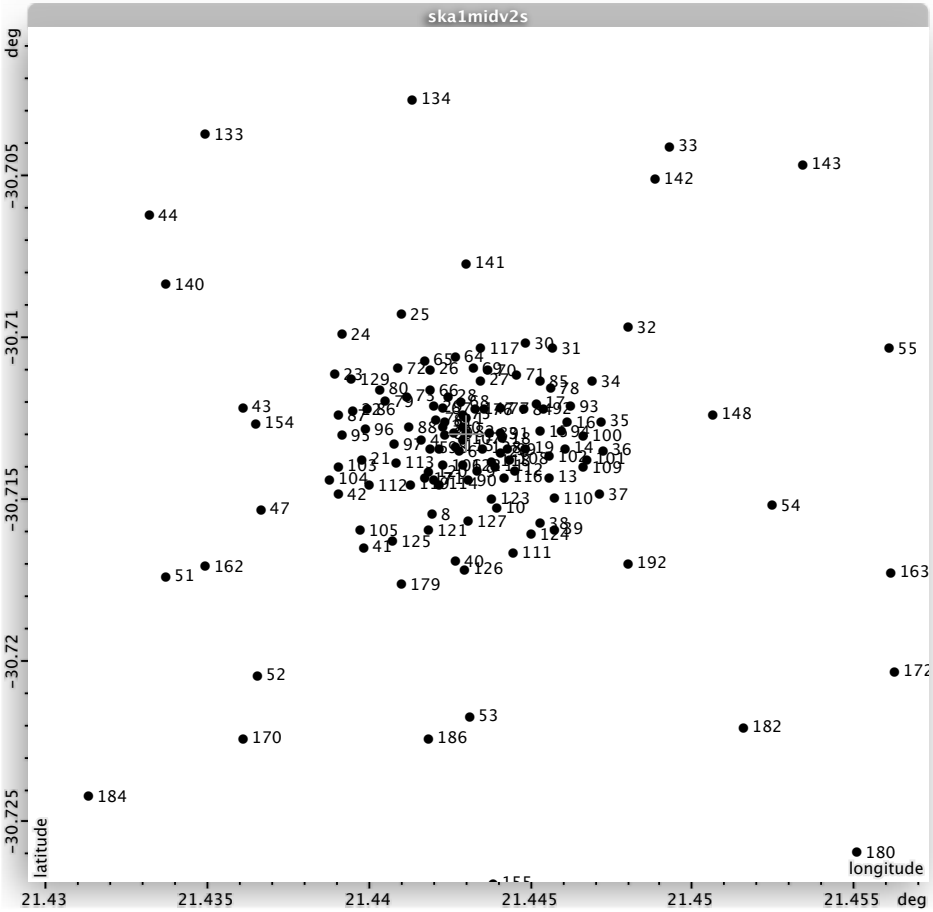
A_{eff}/T_{sys}:	6.2x	6.0x	16x
Survey Speed:	74x	22x	520x

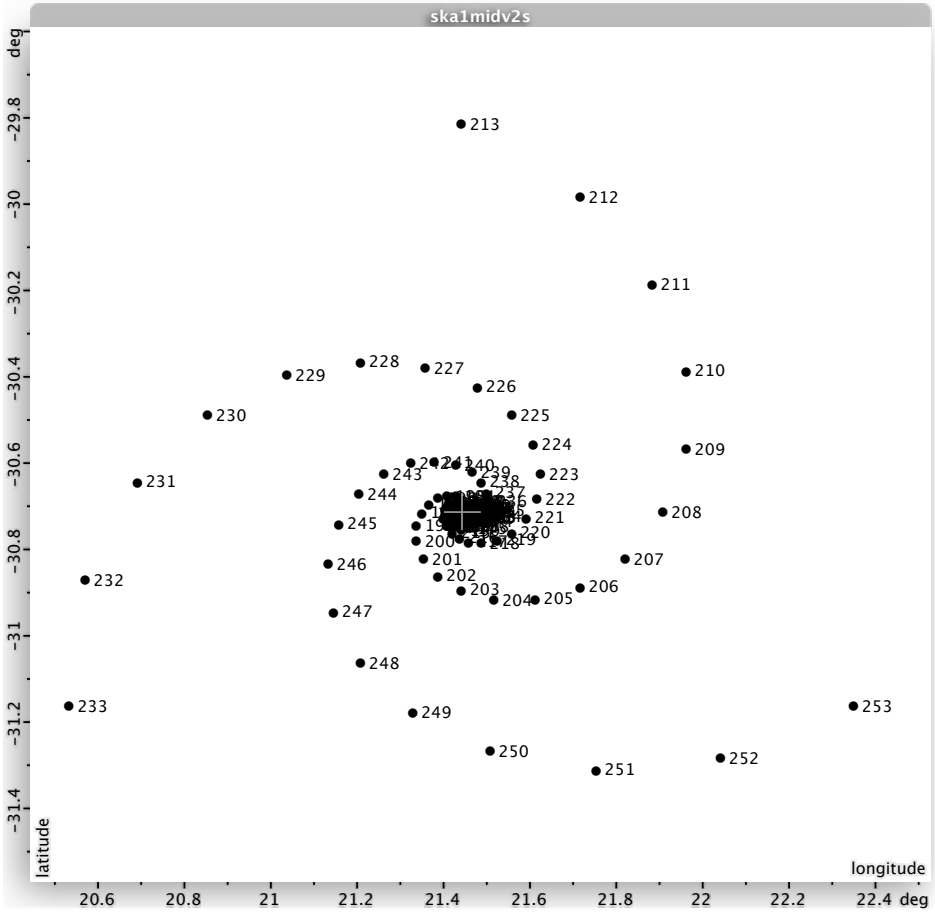
SKA1 “2nd generation” configurations



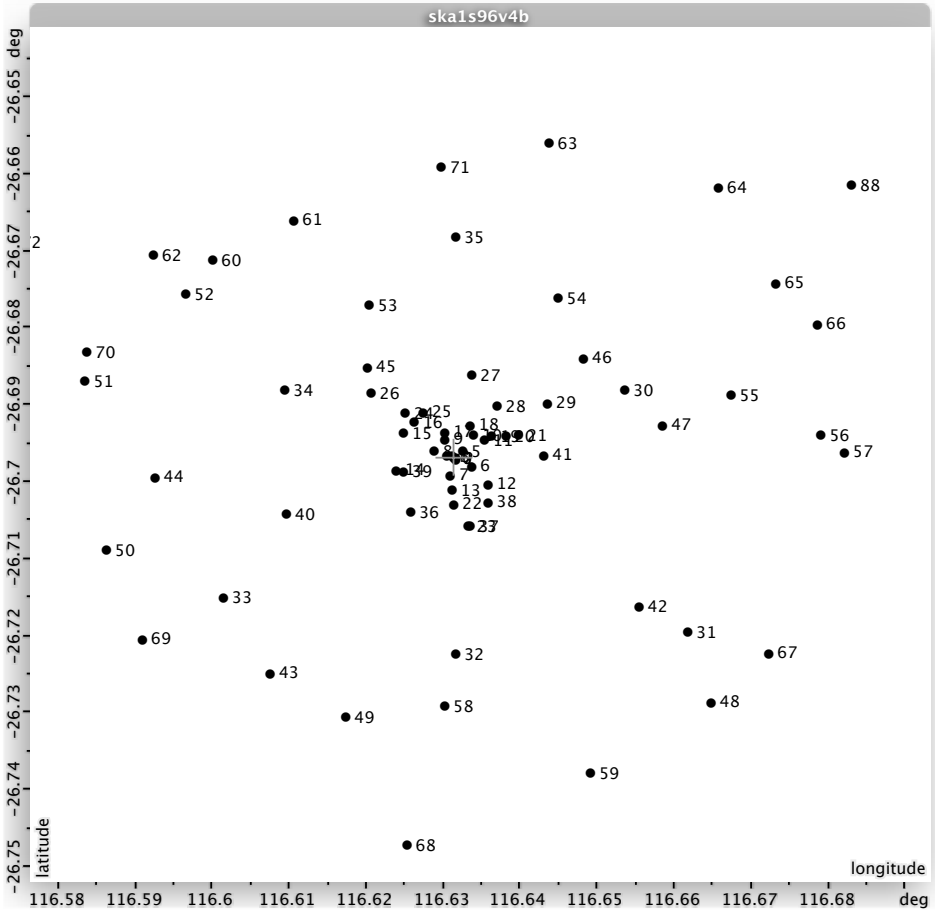


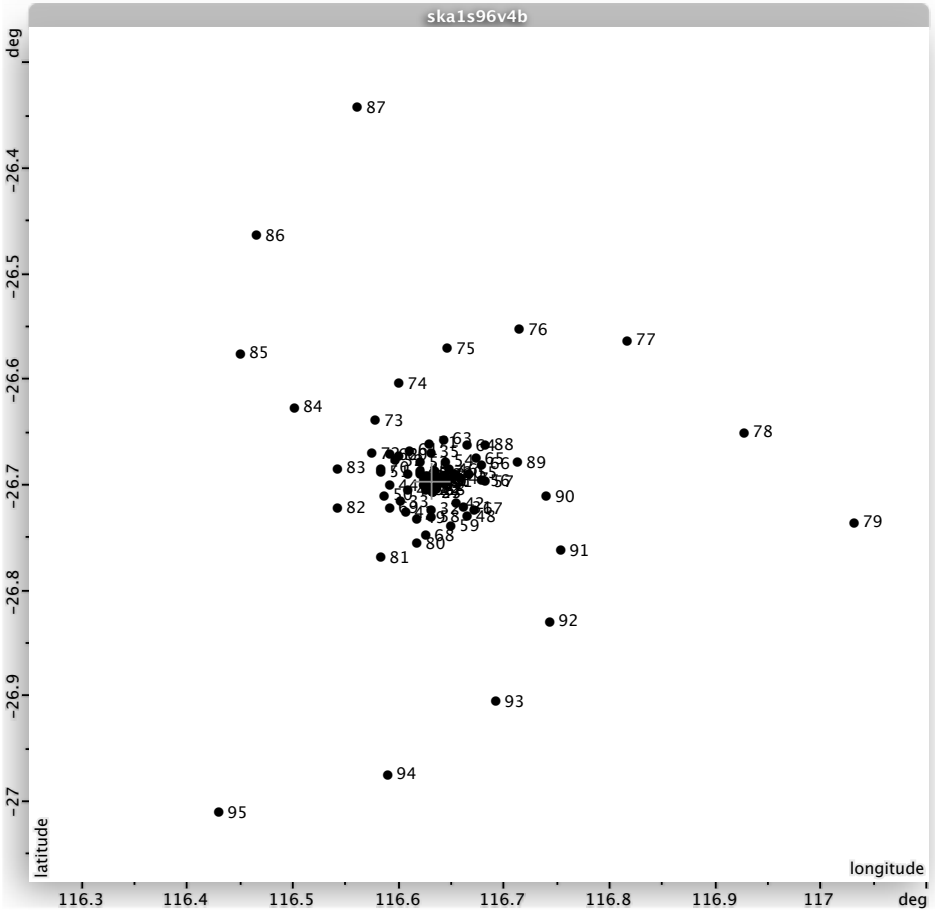
SKA1 “2nd generation” configurations



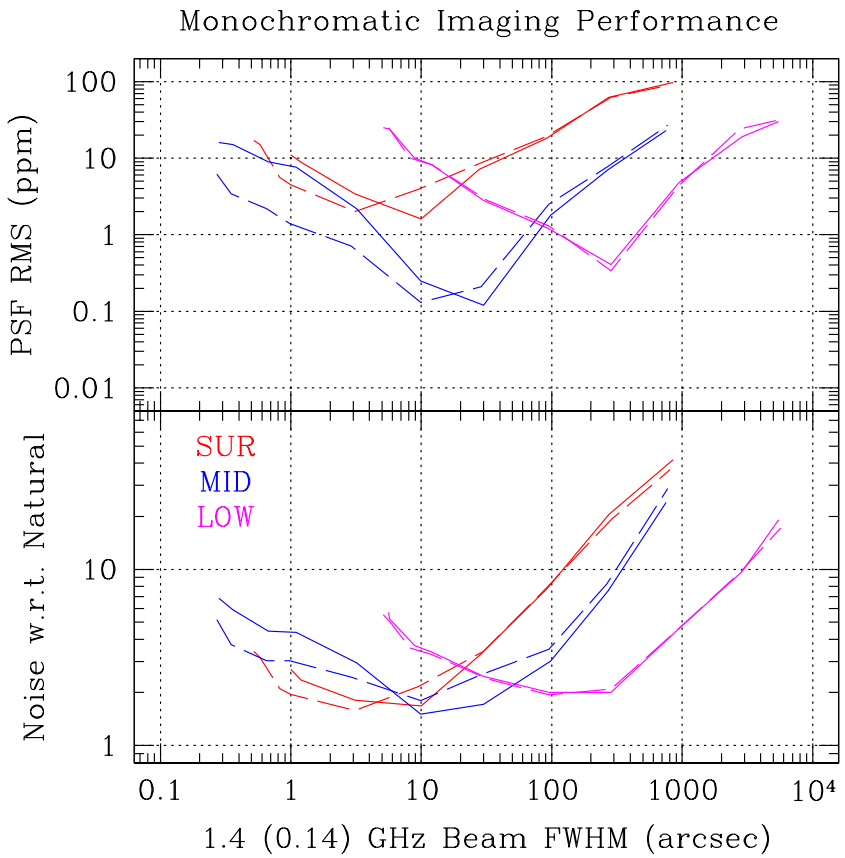


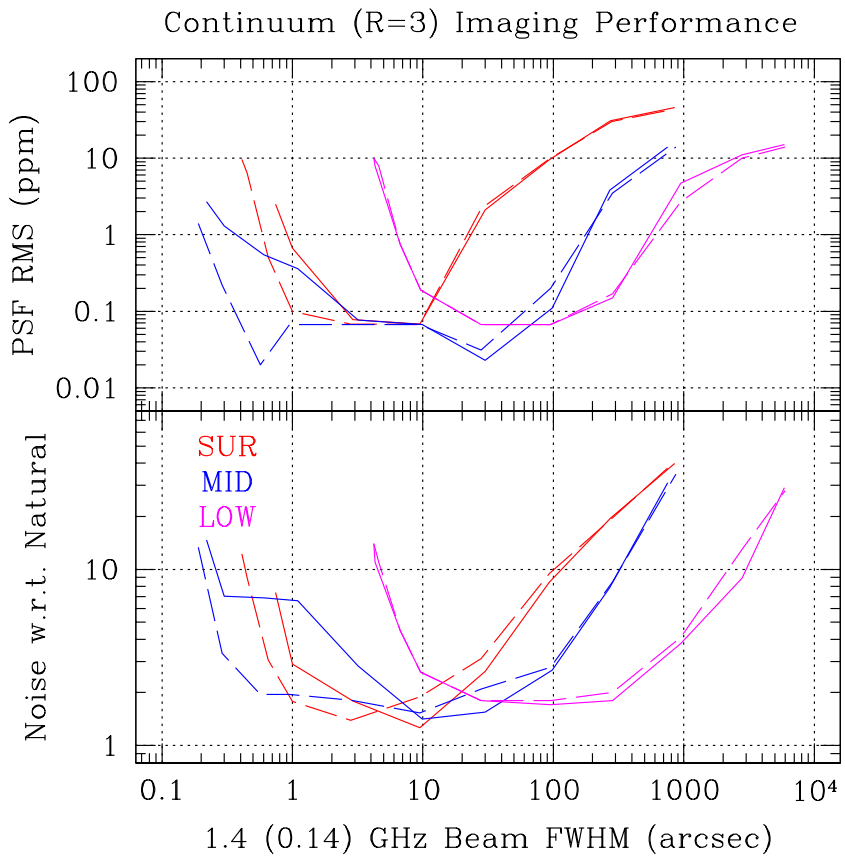
SKA1 “2nd generation” configurations

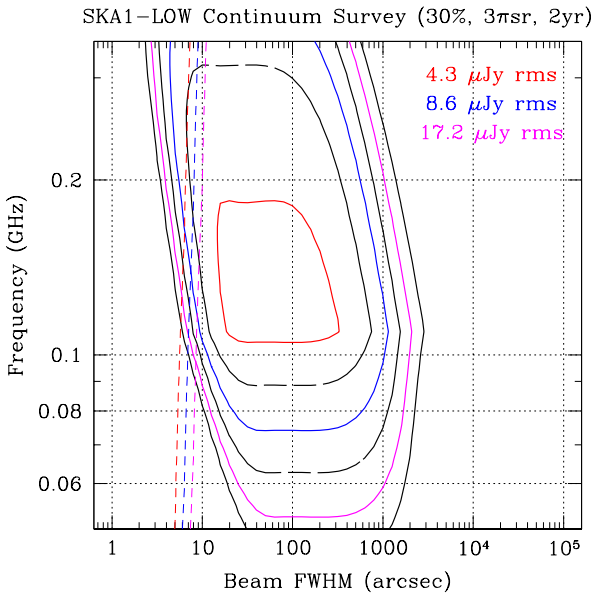


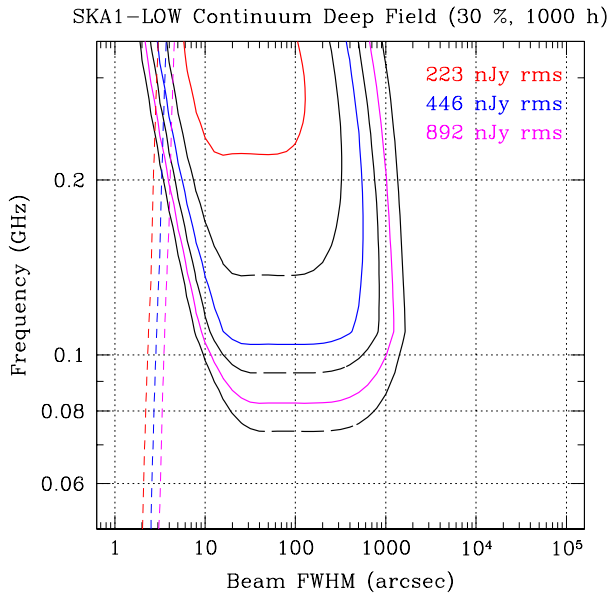


SKA1 performance as function of scale



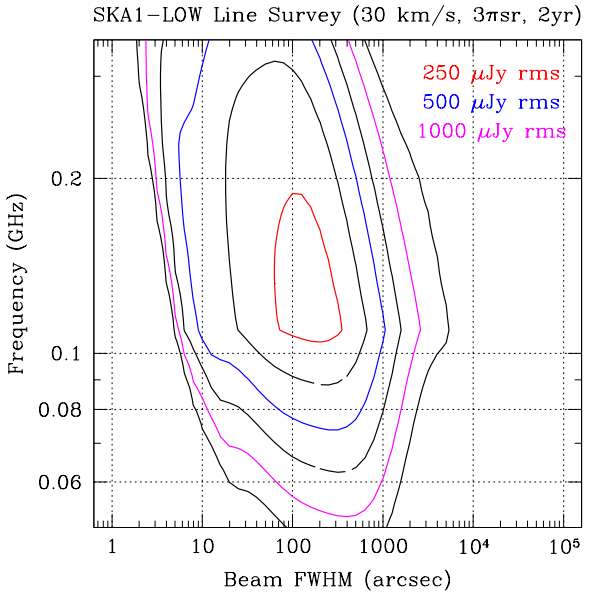


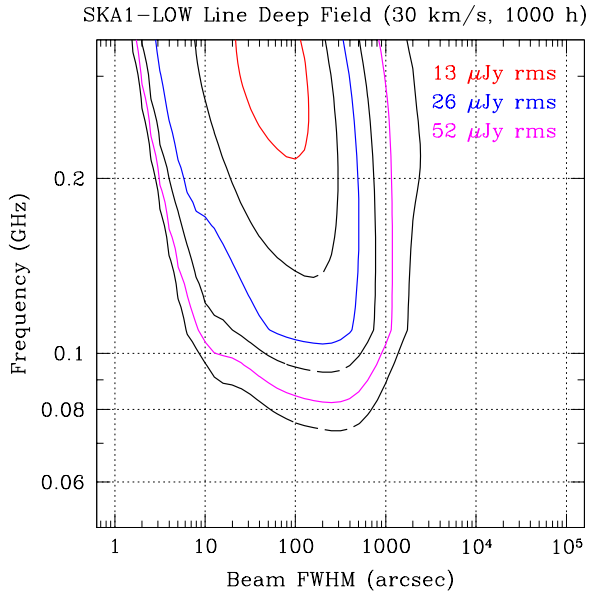


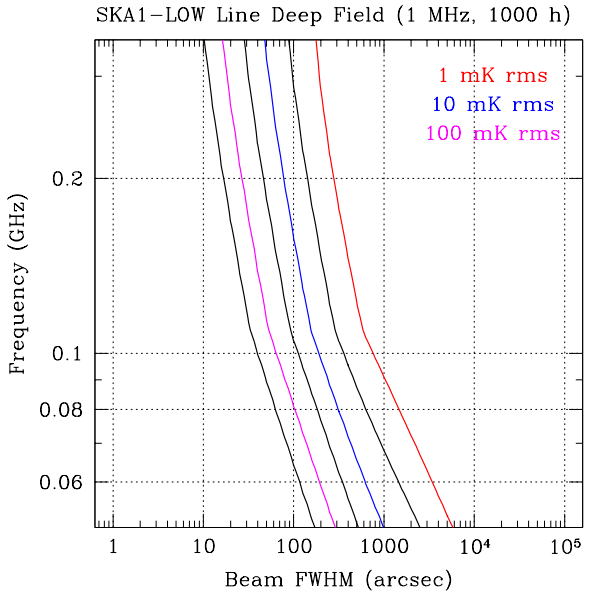


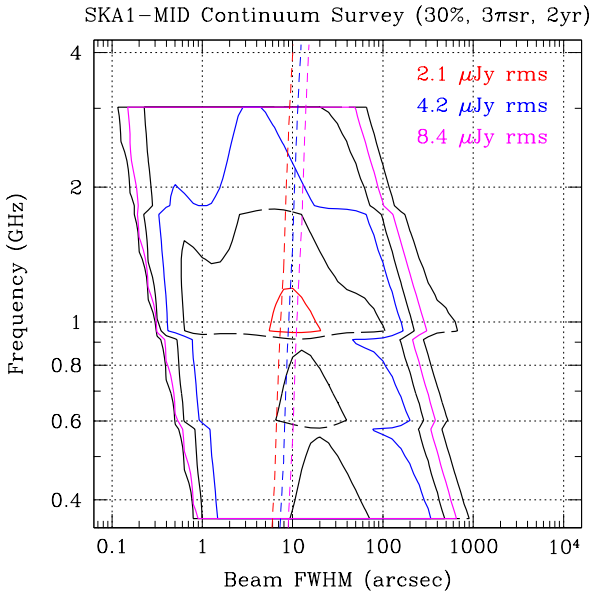
SEFD of full array @ 50, 110, 160, 220 MHz: 19, 2.9, 2.6 2.6 Jy

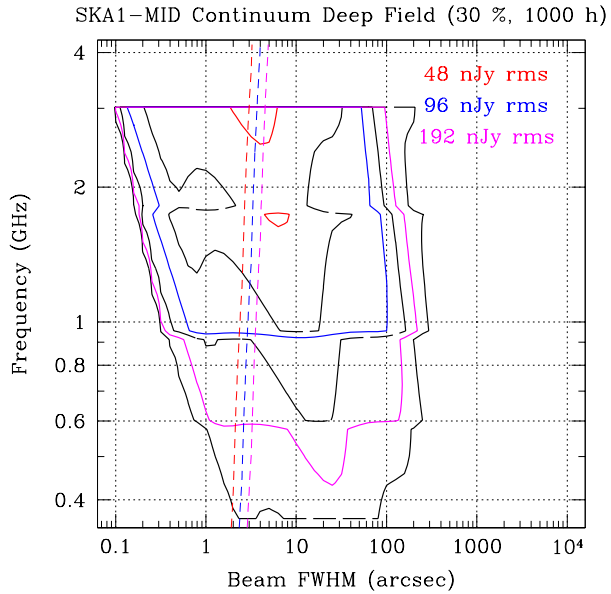
45m Station FoV @ 50, 110, 160, 220 MHz: 78, 16, 7.6, 4.0 deg^2







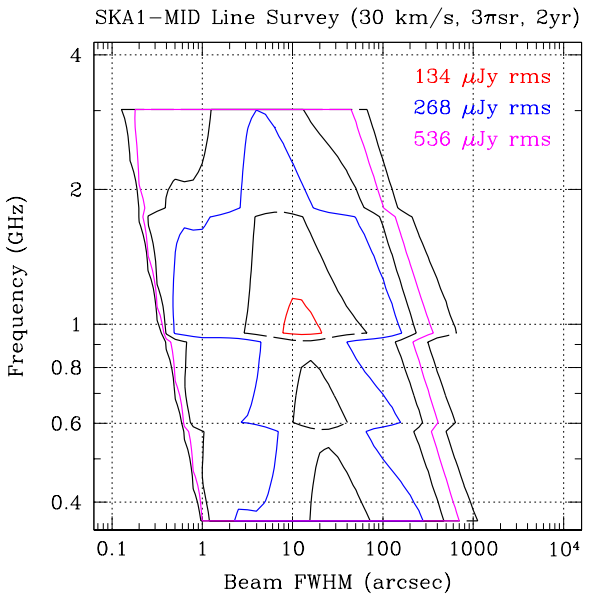


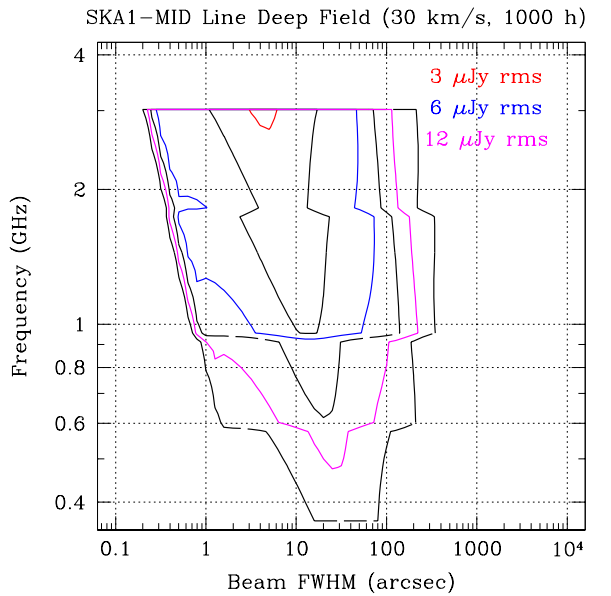


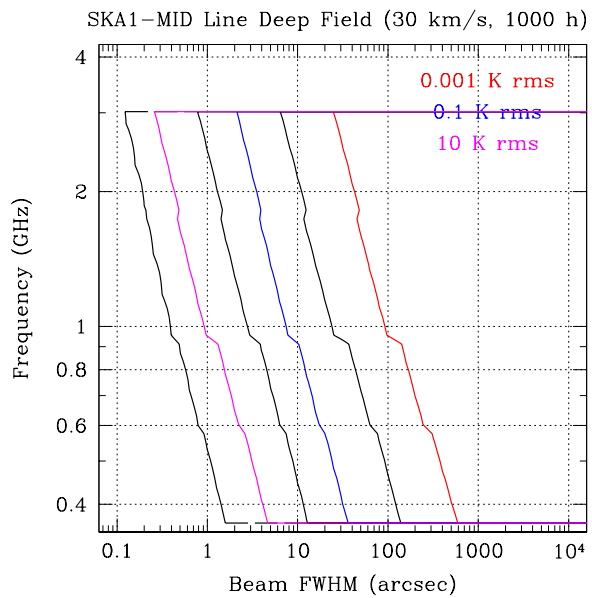
SEFD of 190 SKA Dishes: 3.5, 2.1, 2.1 Jy
SEFD of 64 MeerKAT Dishes: 13, 8.6, 0 Jy

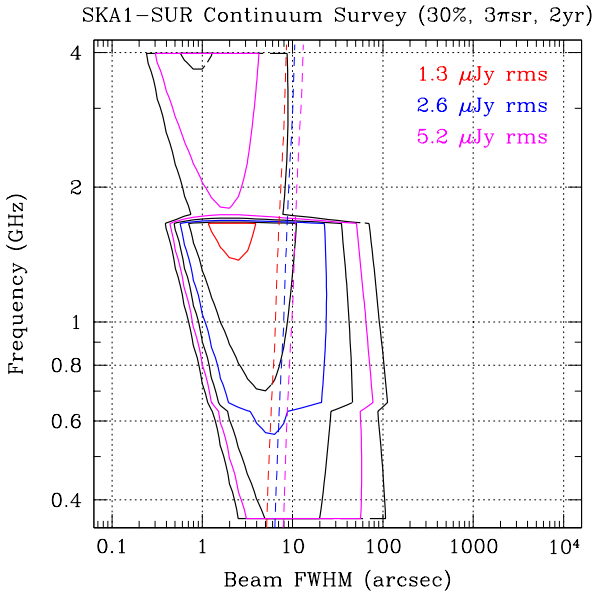
Total SEFD of 190xSKA plus 64xMeerKAT: 3.5/2.8, 1.7, 2.1 Jy

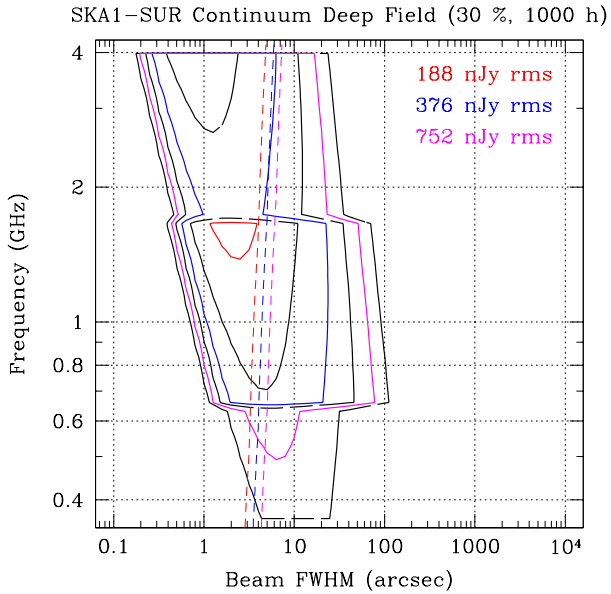
FoV @ Band Centre: 3.5, 1.0 0.18 deg^2







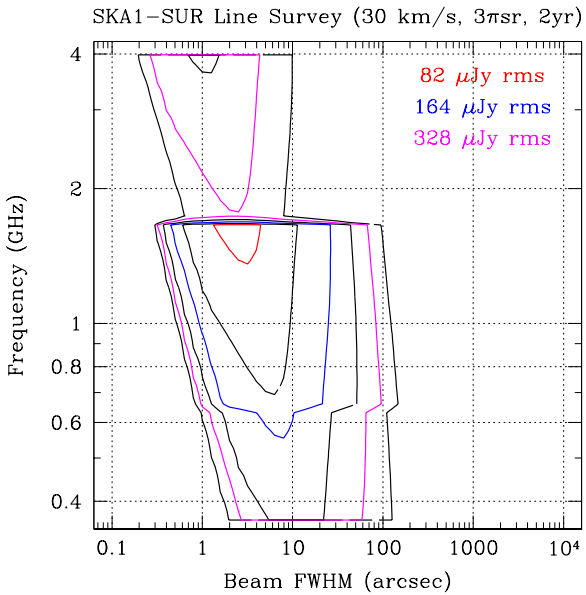


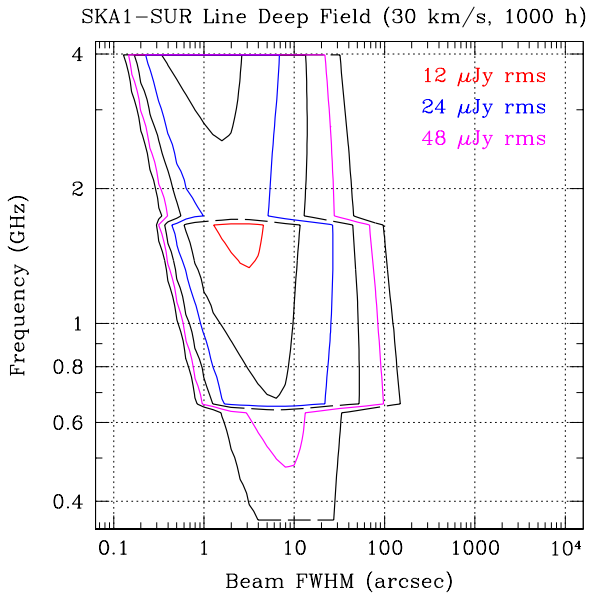


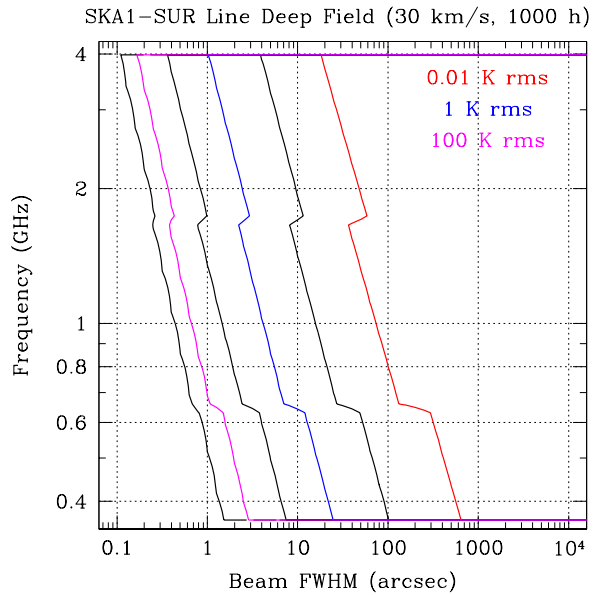
SEFD of 60 SKA Dishes: 16, 9.8, 13 Jy
SEFD of 36 ASKAP Dishes: 0, 25, 0 Jy

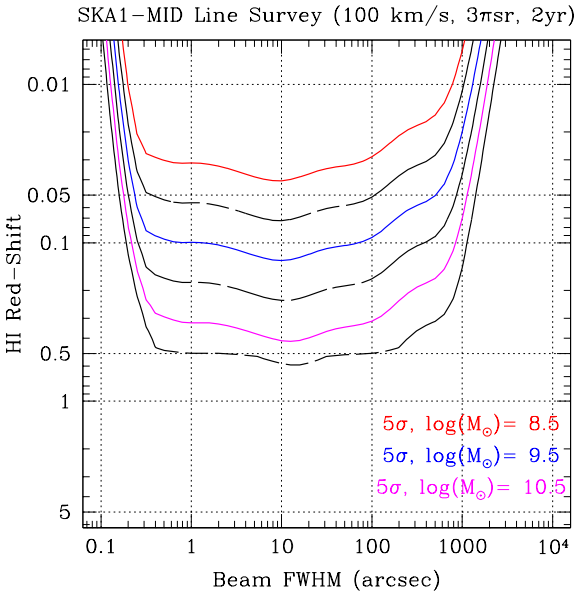
Total SEFD of 60xSKA plus 36xASKAP:
16, 6.7, 13 Jy

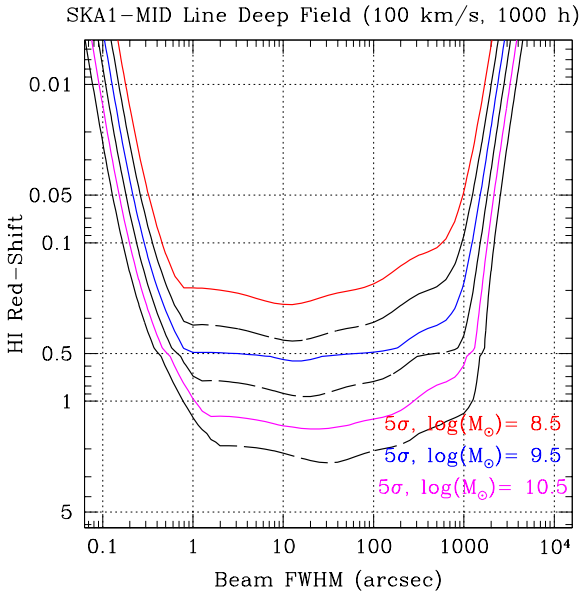
PAF FoV: 126, 36, 6.5 deg^2
(designed for 36 beams @ band centre)





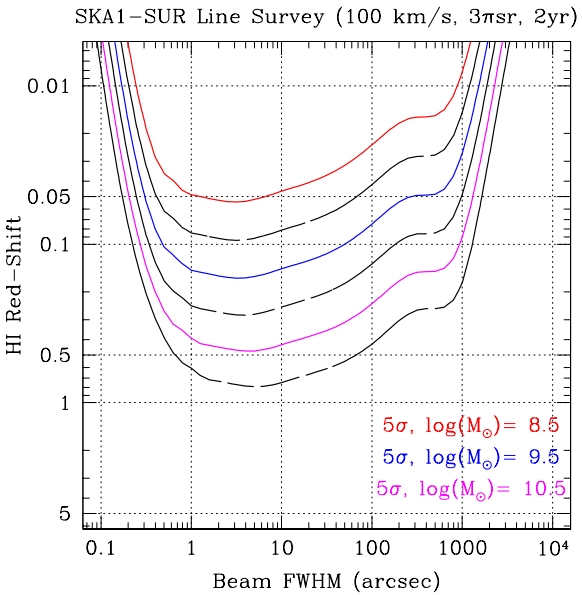


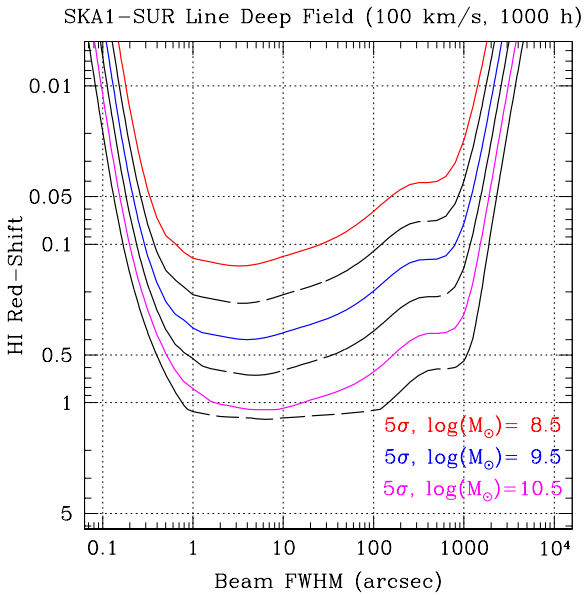




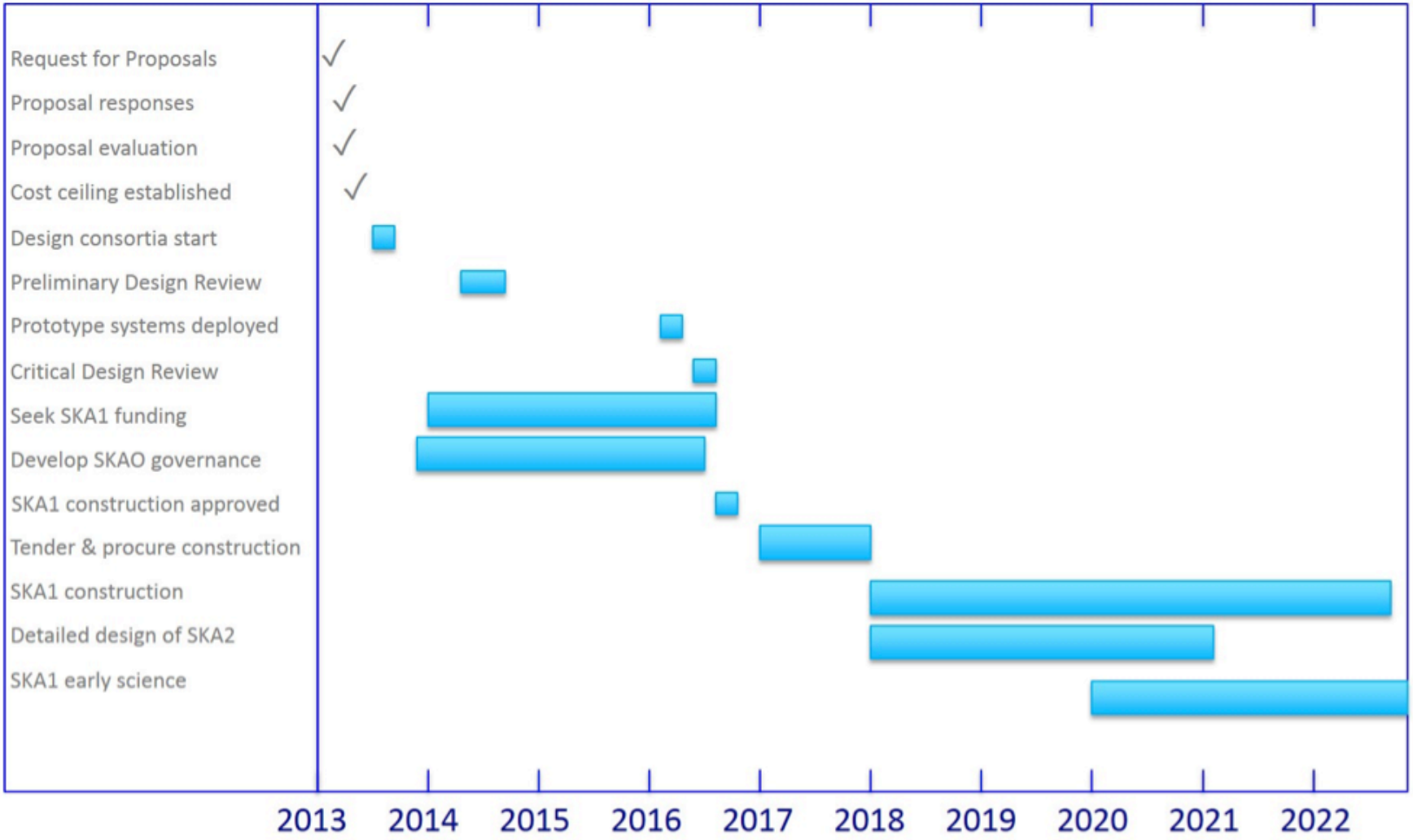
$\mathrm{Log}(M_{\odot}) = 8.5, 9.5\ 10.5$

= Dwarf, M^{*}_{HI}, ultra-gas-rich





Timeline


Request for Proposals
Proposal responses
Proposal evaluation
Cost ceiling established
Design consortia start
Preliminary Design Review
Prototype systems deployed
Critical Design Review
Seek SKA1 funding
Develop SKAO governance
SKA1 construction approved
Tender & procure construction
SKA1 construction
Detailed design of SKA2
SKA1 early science
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

Thank you

www.skatelescope.org