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The new, improved SKAcost: Design solutions from 70 MHz to 10 GHz

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We present some new telescope design solutions in “SKAcost” which incorporate all the receptor types under consideration for the Square Kilometre Array. The SKA Reference Design is a result of several years of science-engineering interaction and includes aperture arrays, and dishes with phased array feeds and/or single-pixel feeds, as receptors. The final mix of receptor types will be an outcome of PrepSKA, so there is an imperative to understand how performance characteristics and costs scale as the design changes. We highlight SKAcost’s capability as a systems engineering tool by illustrating some of these trade-offs.

We extend the work of SKA Memo 100 to reflect current thinking and demonstrate new features of SKAcost, such as tracking power and easily identifying dominant component and subsystem costs. We show alternative solutions for the long baseline component of the SKA as an example of the flexibility of the designs. Additionally, we give examples of models presently being updated with information from SKA technology demonstrators such as ASKAP and the MWA, and indicate the future direction and uses for SKAcost.

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