B01r Engineering Challenges in SKA1 and SKA2

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The SKA vision is being implemented in two phases, distinguished both by scale and technology. The second phase, SKA2, is delayed by at least 5 years in order that lessons learned from the first phase, SKA1, can be applied in the development of the second phase. SKA1 is largely amenable to standard engineering solutions, at achievable cost levels. However there are some areas where the specifications require technology growth over that available today. The key areas are in signal processing, signal transmission, data processing, and power efficiency. Power efficiency in particular drives operational costs, which are likely to be tight in any plausible scenario. A system-wide budget allocation process is in place to control the costs for SKA1. SKA2 is very roughly an order of magnitude larger in number of dishes. For SKA2, these key areas scale either linearly, quadratically, or higher as the number of dishes. Thus for example, the SKA1 power requirement could rise to well over 100MW, and will shift towards the signal processing and data processing.

In my talk I will discuss these engineering challenges for SKA1 and SKA2 and the prospects for enabling solutions for SKA2.