Title: Spacecraft Tracking and Navigation with the SKA

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Abstract:

The SKA could provide a dramatic improvement over the existing Deep Space Network for both telemetry reception and for spacecraft navigation. These improvements include a two-orders-of-magnitude increase in downlink data rates, flexible sub-arraying to track multiple spacecraft simultaneously, increased reliability, accurate real-time angular spacecraft tracking, and a decrease in the cost per unit of sensitivity. In addition to allowing increased data rates for currently planned missions, the sensitivity of the SKA could be used to enable completely new types of science missions utilizing lighter, lower power, and less expensive spacecraft. The financial benefits to NASA of reduced spacecraft mass and power, and of a reduced need for data relay spacecraft, could be very significant when integrated over the lifetime of the SKA.