

SOCS-Scheduler Capabilities

Topic	Capability / feature	Implemented	Status	Component	Requirement?	Feature-based status?
Version 0.1 - Sept 30, 2015						
Planning	Requirements Document written and accepted	-	done			
Planning	Development plan & reporting system created and synced with PMCS	-	done			
Proposal Controls	Update scheduled and unscheduled Downtime (verify; 20 years)	-	done	SOCS		
Proposal Controls	Start simulation in 2022 instead of 1993	-	done	SOCS		
Supporting Capabilities	Verification benchmark set of runs and metrics to ensure code works as designed (science performance -validation - is a separate step)		In Progress (e.g. Tier 1)	OpSim		
Version 0.2 - Dec 12, 2015						
Proposal Controls	Scripted cadences capability (includes TOOs; and be able to switch back and forth between scripted and regular) [via Sequencer?]	v0.2	done	SOCS		
System Capabilities	Standardize use of radians (inward facing) and degrees (outward facing) to project norm / match with MAF	v0.2	done	SOCS /Scheduler		
Version 0.3 - May 20, 2016						
Proposal Controls	Serendipity – be able to swap modes between counting a visit separately for an individual proposal; and counting for multiple proposals for which it fulfills.	v0.3	done	Scheduler		
Models	Improved sims_skybrightness - including better twilight calculation (temporally, spatially and spectrally resolved, included solar variation)	v0.3	done	Scheduler		
Supporting Capabilities	Unit testing	v0.3->v2.2				
Version 1.0 - Feb 28, 2017						
Proposal Controls	Be able to acquire visits uniformly in time	v1.0	done	Scheduler		
Proposal Controls	Camera cadence – N_exp, t_exp, (arbitrary number of exposures and length of exposure in a visit by filter)	v1.0	done	Scheduler		
Proposal Controls	Limit visits to a field to N per night AND NO MORE	v1.0	done	Scheduler		
Proposal Controls	Set an arbitrary value of tuples (visits to a field in a night)	v1.0	done	Scheduler		
Proposal Controls	Standby – have a way to fill observing time that isn't useful for any other proposal (termed "backup")	v1.0		Scheduler		
Proposal Controls	Balance progress of all proposals to their specified goals	v1.0	done	Scheduler		
Proposal Controls	Weight proposed targets with airmass	v1.0	done	Scheduler		
Proposal Controls	Constrain visits in HA	v1.0	need details	Scheduler		
Proposal Controls	Weight proposed targets with HA	v1.0	need details	Scheduler		
Proposal Controls	Specific ra-dec range to specify field area (instead of userRegions) in a variety of coordinate systems	v1.0	done	Scheduler		
Proposal Controls	Refine flags to enable an observation for a particular proposal be set to not count towards completing any other proposal. This is important for rolling cadence studies.	v1.0	done	Scheduler		
Models	Include detailed model of filter change mechanism (not just 120s).	v1.0	need details	Scheduler		
Models	Scattered light model including tracking of bright objects (planets & bright stars) [could be included in sims_skybrightness)	v1.0	need details	SOCS		
System Capabilities	Be able to generate, modify, track and save configuration parameters and files in a more reliable, easier to use way. (github + UI)	v1.0	done	SOCS		
System Capabilities	Capability to record predicted conditions of visit as well as the actual conditions of the visit	v1.0	done	SOCS		

System Capabilities	Capability of repeatability of order of visits given identical set of inputs	v1.0	Verified to 10 years	Scheduler		
System Capabilities	Perturb telescope, camera data sent to the Scheduler to simulate real conditions	v1.0	v1.0 simple model in place, need more use cases	SOCS		
Version 1.1 - Jul 31, 2017						
Models	Deterministic look-ahead for area distribution proposals (and QA metrics ?)	v1.1		Scheduler		
System Capabilities	Perturb weather data sent to the Scheduler to simulate real conditions	v1.1		SOCS		
Version 1.2 - Nov 30, 2017						
Models	Deterministic look-ahead for time sequence proposals (and QA metrics ?)	v1.2		Scheduler		
Version 1.3 - Mar 31, 2018						
System Capabilities	Be able to simulate visits at three orders of magnitude faster than they are happening in real time	v1.3		Scheduler		
Version 1.4 - Sep 30, 2018						
Supporting Capabilities	Failure mode handling (e.g. image quality, chip failure, partial failures)	v1.4		Scheduler		
Supporting Capabilities	Warm-start capability	v1.4		SOCS /Scheduler		
Version 1.5 - Feb 28, 2019						
Models	Capability of dithering field centers (QA metrics ?).	v1.5		Scheduler		
System Capabilities	Using ROTSKYPOS history, ensure it is random	v1.5		Scheduler		
Models	Use all-sky camera transparency (cloud) current conditions to select fields	v1.5		Scheduler		
Version 2.0 - Jul 31, 2019						
Models	Publishable observing queue (2 hours ahead) for external use (follow up and laser guide star selection) and a protocol for determining when to cancel or revise it.	v2.0		Scheduler		
Version 2.1 - Nov 30, 2019						
Models	Use available all-sky camera data for clouds/transparency model	v2.1		SOCS		
Models	Predictive cloud model (spatial and temporal)	v2.1		SOCS		
Models	Predictive/forecast weather model including El Nino. (QA Metrics to measure weather difference, and impact of forecasting/lookahead)	v2.1		SOCS		
Models	Non-deterministic look-ahead (weather, clouds, seeing)	v2.1		Scheduler		
Version 2.2 - Apr 30, 2020						
System Capabilities	Accept alternate algorithms for field selection	v2.2		Scheduler		
As Time Permits						
Proposal Controls	Be able to prioritize proposal/field/filter combinations with environmental conditions (and possibly with time e.g. good seeing image in first year)	?		Scheduler		
Proposal Controls	Continuous coadded depth as a weighting function for field selection; or Ability to adjust exposure length according to current m5 conditions	?		Scheduler		
Proposal Controls	Ability to apply weight to a field related to parallax factor.	?		Scheduler		
Models	Improve camera/shutter model	?		Scheduler		
Models	Include focal plane geometry should be to help optimize the dithering strategy (raft and chip gaps, vignetting).	?		Scheduler		
Models	Ability to control placement of bright star or planet on focal plane (e.g. between CCDs), and a strategy for doing so.	?		SOCS /Scheduler		
Models	Ability of a proposal to (temporarily) shut off other proposals.	?!!!		Scheduler		

Models	Use real data to create improved weather model (all-sky camera; DIMM) (QA Metrics)	TBD	interface in v1.0	SOCS		
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