

Visual Schema for JSON files submitted to the SEP Scoreboard

NOTE: naming convention for files submitted:

ModelShortName.PredictionWindowStartTime.IssueTime.json

JSON key		Type	Boundaries	Description	Corresponding command line argument for helper script
sep_forecast_submission			required		
model			required	Model information	
	short_name	string	required	Short name (e.g. acronym) of model to appear on scoreboard. Consider including version number with acronym if distinction needed. 16 character limit.	model-short-name
	spase_id	string	required	Link to URL of full model description metadata in CCMC metadata registry in SPASE format (contact CCMC to register your model).	spase-id
	version	string	required	model version. allows up to 15 characters	
	issue_time	datetime*	required	Forecast issue time (e.g. model run is complete and forecast is created).	issue-time
	mode	string	required	allowed values: forecast, historical, nowcast, simulated_realtime_forecast, simulated_realtime_nowcast	mode
	triggers		optional	Provide if forecast is issued based on a trigger. This can be expanded. Contact CCMC to add your trigger if it is missing.	
	cme		> 1 allowed, optional		
	start_time	datetime*	required, if cme used	Timestamp of 1st coronagraph image CME is visible in	cme-start-time
	liftoff_time	datetime*	optional	Timestamp of coronagraph image with 1st indication of CME liftoff (used by CACTUS)	cme-liftoff-time
	lat	float	optional	CME latitude (deg)	cme-lat
	lon	float	optional	CME longitude (deg)	cme-lon
	pa	float	optional	CME plane-of-sky position angle (measured from solar north in degrees counter-clockwise)	cme-pa
	half_width	float	optional	CME half-width (deg)	cme-half-width
	speed	float	optional	CME speed (km/s)	cme-speed
	acceleration	float	optional	CME acceleration (km/s^2)	cme-acceleration
	height	float	optional	CME height at which the above parameters were derived (solar radii from Sun center)	cme-height
	time_at_height	datetime*	optional	CME time at specified height	
	time	datetime*	required, if time_at_height used		cme-time-at-height-time
	height	float	required, if time_at_height used		cme-time-at-height-height
	coordinates	string	required, if lat or lon used	in solar radii	
				Coordinate system for CME lat/lon parameters (e.g. HEEQ or Carrington)	cme-coordinates
	catalog	string	optional	Name of catalog where CME information was pulled from. allowed values: ARTEMIS, DONKI, HELCATS, JHU APL, CACTUS_NRL, CACTUS_SIDC, CORIMP, SEEDS, SOHO_CDAW, STEREO_COR1, SWPC, MISO_XCOR (contact us to add a new catalog name)	cme-catalog
	catalog_id	string	required if catalog=DONKI, otherwise optional	id that uniquely identifies this CME data in the catalog	cme-catalog-id
	urls	string	> 1 allowed, optional	List of urls where CME information can be found, or information was pulled from	cme-urls
	derivation_technique		optional		
	process	string	required if derivation_technique used	automated/manual	
	method	string	required if derivation_technique used	SWPC, CAT, StereoCAT, Plane-of-sky, FlareDerived	
	measurement_type	string	optional	allowed values: LE (leading edge), TE (Trailing Edge), RHB (Right Hand Boundary), LHB (Left Hand Boundary), BW (Black White Boundary), COR (Prominence Core), DIS (Disconnection Front), SH (Shock Front)	
	flare		> 1 allowed, optional		
	last_data_time	datetime*	required, if flare used	Last time data timestamp that was used to create forecast (relevant for forecasts issued before flare end times)	flare-last-data-time
	start_time	datetime*	optional	Flare start time	flare-start-time
	peak_time	datetime*	optional	Flare peak time	flare-peak-time
	end_time	datetime*	optional	Flare end time	flare-end-time
	location	string	optional	Flare location in Stonyhurst coordinates. NOOW00/S00E00 format	flare-location
	intensity	float	optional	Flare intensity (W/m^2)	flare-intensity
	integrated_intensity	float	optional	Flare integrated intensity (J/m^2)	flare-integrated-intensity
	noaa_region	integer	optional	Associated NOAA active region number (including the preceding 1)	flare-noaa-region
	peak_ratio	float	optional	The peak ratio of the long and short GOES X-ray channels	
	catalog	string	optional	Name of catalog where flare information was pulled from. allowed values: SolarSoft Latest Events, DONKI, Solar, Demon, COMESER, SWPC (contact us to add a new catalog name)	flare-catalog
	catalog_id	string	required if catalog=DONKI, otherwise optional	id that uniquely identifies this flare data in the catalog	flare-catalog-id
	urls	string	> 1 allowed, optional	List of urls where flare information can be found, or information was pulled from	flare-urls
	cme_simulation		> 1 allowed, optional		
	model	string	required, if cme_simulation used	Model name	cme-sim-model
	simulation_completion_time	datetime*	optional	Simulation completion time	cme-sim-completion-time
	urls	string	> 1 allowed, optional	List of urls where simulation information can be found, or information was pulled from	cme-sim-urls
	particle_intensity		> 1 allowed, optional		
	observatory	string	required, if particle_intensity used	Name of observatory/spacecraft/model data are from	pi-observatory
	instrument	string	required, if particle_intensity used	Name of instrument data are from	pi-instrument
	last_data_time	datetime*	required, if particle_intensity used	Last time data timestamp used to create forecast	pi-last-data-time
	intensity	float	optional	Intensity value	
	units	string	required, if intensity used	units for intensity value	
	energy_channel	float	required, if intensity used	energy channel info for the intensity value	
	min	float	required, if intensity used	min of energy channel range	
	max	float	required, if intensity used	max of energy channel range. -1 represented an unbounded integral channel	
	units	string**	required, if intensity used	energy channel units	
	species	string	required, if intensity used	allowed values: electron, proton, helium, helium3, helium4, oxygen, iron, lon	
	forecast_issue_time	datetime*	optional	For alert systems based on model inputs, the intensity value is a model forecast. Enter the issue time for that forecasted intensity value here.	
	ongoing_events		> 1 allowed, optional	If an ongoing event triggers your forecast, list the properties you used	
	start_time	datetime*	required, if ongoing_events used	start time	pi-ongoing-events-start-time
	threshold	float	required, if ongoing_events used	threshold used to define the event in pfu	pi-ongoing-events-threshold
	energy_min	float	required, if ongoing_events used	min of energy channel range in MeV	pi-ongoing-events-energy-min
	energy_max	float	required, if ongoing_events used	max of energy channel range in MeV. -1 represented an unbounded integral channel	pi-ongoing-events-energy-max
	human_evaluation		> 1 allowed, optional		
	last_data_time	datetime*	required, if human_evaluation used	Last time data timestamp used to create forecast	
	inputs		> 1 allowed, optional	Provide if key model inputs are not represented in the triggers field	
	magnetic_connectivity		> 1 allowed, optional	Provide if specific magnetic connectivity information was used to produce your forecast	
	method	string	required, if magnetic_connectivity used	allowed values: Parker Spiral, PFSS-Parker Spiral, WSA, WSA-ENLIL, ADAPT-WSA-ENLIL (contact us to add your method to this format)	magcon-method
	lat	float	optional	latitude (deg) position of magnetic field line footprint linking the observing spacecraft to the Sun (in Stonyhurst coordinates).	magcon-lat
	lon	float	required, if magnetic_connectivity used	longitude (deg) position of magnetic field line footprint linking the observing spacecraft to the Sun (in Stonyhurst coordinates).	magcon-lon
	connection_angle		optional	angle between the related solar event and the foot point of the magnetic field line linking the observing spacecraft to the Sun.	
	great_circle	float	optional	great circle distance between the solar event and the magnetic connectivity footprint (deg)	magcon-angle-great-circle
	lat	float	optional	connection angle lat = solar event lat - magnetic connectivity footprint lat (deg)	magcon-angle-lat

			lon	float	required, if connection_angle used	connection angle lon = solar event lon - magnetic connectivity footprint lon [deg]	magcon-angle-lon
			solar_wind		optional	Use if a certain solar wind speed was assumed to compute the magnetic connectivity	
			observatory	string	optional	Name of observatory/spacecraft data are from	magcon-solar-wind-observatory
			speed	float	required, if solar_wind used	Assumed solar wind speed to compute magnetic connectivity	magcon-solar-wind-speed
			magnetogram		> 1 allowed, optional	Provide if a magnetogram was used to produce your forecast	
			observatory	string	required, if magnetogram used	Name of observatory/spacecraft data are from	magnetogram-observatory
			instrument	string	required, if magnetogram used	Name of instrument data are from	magnetogram-instrument
			products		optional		
			product	string	> 1 allowed, optional	Name of data product used	magnetogram-product
			last_data_time	datetime*	required, if products used, > 1 allowed	Last time data timestamp available at the time of forecast, and was used to make the forecast	magnetogram-product-last-data-time
			coronagraph		> 1 allowed, optional	Provide if a coronagraph was used to produce your forecast	
			observatory	string	required, if coronagraph used	Name of observatory/spacecraft data are from	
			instrument	string	required, if coronagraph used	Name of instrument data are from	
			products		optional		
			product	string	> 1 allowed, required, if products used	Name of data product used	
			last_data_time	datetime*	> 1 allowed, required, if products used	Last time data timestamp available at the time of forecast	
			forecasts		> 1 allowed, at least 1 required	>1 allowed such that forecasts for multiple energy channels can be submitted in one file (if they have the same issue time)	
			energy_channel		required	Each forecast is defined by the energy channel specified	
			min	float	required	min of energy channel range	energy-min
			max	float	required	max of energy channel range. -1 represented an unbounded integral channel	energy-max
			units	string**	required	energy channel units	energy-units
			species	string	required	allowed values: electron, proton, helium, helium3, helium4, oxygen, iron, lon	species
			location	string	required	allowed values: mercury, venus, earth, mars, psp, stereoa, stereob, dawn, juno, L1, L2, L4, L5	location
			prediction_window		required	all forecast values provided are relevant only in this prediction window	prediction-window
			start_time	datetime*	required	start of forecast prediction window	(first value given for 'prediction-window')
			end_time	datetime*	required	end of forecast prediction window	(second value given for 'prediction-window')
			peak_intensity		optional		
			intensity	float	required, if peak_intensity used	forecast peak intensity at onset value	peak-intensity
			units	string**	required, if peak_intensity used	forecast peak intensity at onset value units	peak-intensity-units
			uncertainty	float	optional	forecast peak intensity at onset uncertainty value (same units as peak intensity) (for symmetric uncertainties) (cannot be used with either uncertainty_low or uncertainty_high)	peak-intensity-uncertainty
			uncertainty_low	float	required, if uncertainty_high used	forecast peak intensity at onset lowest uncertainty value (same units as peak intensity) (for asymmetric uncertainties)	peak-intensity-uncertainty-low
			uncertainty_high	float	required, if uncertainty_low used	forecast peak intensity at onset highest uncertainty value (same units as peak intensity) (for asymmetric uncertainties)	peak-intensity-uncertainty-high
			time	datetime*	optional	forecast time that the peak intensity value will be reached	peak-intensity-time
			peak_intensity_esp		optional		
			intensity	float	required, if peak_intensity_esp used	forecast peak intensity value in the vicinity of shock passage (ESP)	peak-intensity-esp
			units	string**	required, if peak_intensity_esp used	forecast peak intensity ESP units	peak-intensity-esp-units
			uncertainty	float	optional	forecast peak intensity ESP uncertainty value (same units as intensity) (for symmetric uncertainties) (cannot be used with either uncertainty_low or uncertainty_high)	peak-intensity-esp-uncertainty
			uncertainty_low	float	required, if uncertainty_high used	forecast peak intensity ESP lowest uncertainty value (same units as intensity) (for asymmetric uncertainties)	peak-intensity-esp-uncertainty-low
			uncertainty_high	float	required, if uncertainty_low used	forecast peak intensity ESP highest uncertainty value (same units as intensity) (for asymmetric uncertainties)	peak-intensity-esp-uncertainty-high
			time	datetime*	optional	forecast time that peak intensity ESP value will be reached	peak-intensity-esp-time
			peak_intensity_max		optional		
			intensity	float	required, if peak_intensity used	forecast max peak intensity for the entire prediction window value	peak-intensity-max
			units	string**	required, if peak_intensity used	forecast max peak intensity value units	peak-intensity-max-units
			uncertainty	float	optional	forecast max peak intensity uncertainty value (same units as intensity) (for symmetric uncertainties) (cannot be used with either uncertainty_low or uncertainty_high)	peak-intensity-max-uncertainty
			uncertainty_low	float	required, if uncertainty_high used	forecast max peak intensity lowest uncertainty value (same units as intensity) (for asymmetric uncertainties)	peak-intensity-max-uncertainty-low
			uncertainty_high	float	required, if uncertainty_low used	forecast max peak intensity highest uncertainty value (same units as intensity) (for asymmetric uncertainties)	peak-intensity-max-uncertainty-high
			time	datetime*	optional	forecast time that the max peak intensity value will be reached	peak-intensity-max-time
			event_lengths		> 1 allowed, optional	must fall within prediction window	
			start_time	datetime*	required	time that the intensity exceeds threshold_start	event-length-start-time
			end_time	datetime*	optional, unless fluences is used	time that the intensity drops below threshold_end	event-length-end-time
			threshold_start	float	required	threshold used to extract start time	event-length-threshold
			threshold_end	float	optional	threshold used to extract end time, if not provided assume threshold_end=threshold_start	
			threshold_units	string**	required	units of threshold	event-length-threshold-units
			fluences		> 1 allowed, optional	corresponds to event lengths	
			fluence	float	required, if fluence used	forecast fluence value (corresponds to event length)	fluence
			units	string**	required, if fluence used	forecast fluence units	fluence-units
			uncertainty_low	float	required, if uncertainty_high used	forecast fluence's lowest uncertainty value (same units as fluence) (for asymmetric uncertainties)	fluence-uncertainty-low
			uncertainty_high	float	required, if uncertainty_low used	forecast fluence's highest uncertainty value (same units as fluence) (for asymmetric uncertainties)	fluence-uncertainty-high
			fluence_spectra		> 1 allowed, optional		
			start_time	datetime*	required if fluence_spectra used	time that the intensity exceeds threshold_start	
			end_time	datetime*	required if fluence_spectra used	time that the intensity drops below threshold_end	
			threshold_start	float	required if fluence_spectra used	threshold used to extract start time	
			threshold_end	float	required if fluence_spectra used	threshold used to extract end time	
			threshold_units	string**	required if fluence_spectra used	units of threshold	
			fluence_units	string**	required if fluence_spectra used	units of threshold	
			fluence_spectrum		required if fluence_spectra used, > 1 allowed		
			energy_min	float	required if fluence_spectra used	low edge of energy bin in MeV	
			energy_max	float	required if fluence_spectra used	high edge of energy bin in MeV, -1 represented an unbounded integral channel	
			fluence	float	required if fluence_spectra used	fluence value that corresponds to energy bin (defined by energy_min, energy_max), and calculated between start_time and end_time	
			threshold_crossings		> 1 allowed, optional	multiple threshold_crossings can be provided for the same forecast energy channel	
			crossing_time	datetime*	required, if threshold_crossings used	forecast threshold crossing time	thresh-crossing-times
			uncertainty	float	optional	forecast crossing time uncertainty in hours	thresh-uncertainties
			threshold	float	required, if threshold_crossings used	the particle intensity exceeds this threshold (e.g. 10 pfu)	crossing-thresholds
			threshold_units	string**	required, if threshold_crossings used	units of threshold	crossing-threshold-units
			probabilities		> 1 allowed, optional	multiple probabilities can be provided for the same forecast energy channel	
			probability_value	float	required, if probabilities used	forecast probability value (range 0 to 1)	probabilities
			uncertainty	float	optional	plus/minus error bar for probability_value (in probability_value units)	prob-uncertainties
			threshold	float	required, if probabilities used	the ESP probability_value forecast is for the particle intensity to exceed this threshold value (e.g. 10 pfu)	prob-thresholds
			threshold_units	string**	required, if probabilities used	units of threshold	prob-threshold-units
			all_clear		optional	If you do not provide an all-clear forecast do not enter this key.	

			all_clear_boolean	boolean	required, if all_clear used	There are three situations for setting all_clear_boolean=false: (1) for >10MeV energy channel, your forecast of peak intensity OR threshold crossing exceeds 10 pfu OR your probability forecast for a threshold of 10 pfu exceeds your custom probability_threshold; (2) for the >100MeV energy channel, your forecast of peak intensity OR threshold crossing exceeds 1 pfu OR your probability forecast for a threshold of 1 pfu exceeds your custom probability_threshold; (3) for your custom (non-integral) energy channel, your forecast peak intensity OR threshold crossing exceeds your custom threshold. Custom cases (3) are being stored but will not be used in the all-clear scoreboard display.	all-clear
			threshold	float	required, if all_clear used	particle intensity threshold value all_clear_boolean refers to. Can be (1) 10 pfu for >10MeV channel (2) 1 pfu for >100MeV channel (3) custom	all-clear-threshold
			threshold_units	string**	required, if all_clear used	units of threshold	all-clear-threshold-units
			probability_threshold	float	optional	probability threshold value all_clear_boolean refers to. Must specify this threshold if setting all_clear_boolean based on probability forecast.	all-clear-probability-threshold
		alert			optional		
			alert_type	string	required, if alerts used	allowed values: quiet, warning, alert	
			flux_threshold		required, if alerts used		
			min	float	required, if alerts used		
			max	float	required, if alerts used		
			units	string**	required, if alerts used		
			probability_threshold		optional		
			min	float	required, if probability threshold		
			max	float	required, if probability threshold		
			sep_profile	string	optional	Text file with 2 - 4 columns: datetime* string, predicted SEP intensity for this energy channel (float), optional uncertainty (if symmetric) or uncertainty_low (if asymmetric) (float) value, optional uncertainty_high (float) value. Please name the file uniquely. To accomplish this, we suggest including your model name and issue time in the filename. Guideline: ModelShortName.PredictionWindowStartTime.IssueTime.EnergyChannel.txt Models that produce ensemble SEP profile forecasts can provide a list of text files	sep-profile
		source_info			optional	Information specific to native/raw outputs from observations and models that produce profiles.	
			native_id	string	optional	Specify only if forecast has a native id from your model run	
			native_flux_type	string	optional	allowed values: differential, integral	
		status			optional		
			current_status	string	required, if status used	give the current status of the model/observations	
			comment	string	optional	give more details regarding the current status of the model/observations	
		observations			optional		
			all_clear		optional	use this field for observations helpful for interpreting SEP forecasts/observations. also use the inputs field above to define the observatory and instrument used	
			all_clear_boolean	boolean	required, if all_clear used	true or false	
			all_clear_type	string	required, if all_clear used	allowed values: cme (more can be added upon request)	
		alert			optional		
			alert_type	string	required, if alert used	allowed values: ALERT, OBSERVER ALERT, CANCEL ALERT, SUMMARY	
			start_time	datetime*	required, if alert used	start time of the alert, usually this is the observation start time	
			end_time	datetime*	optional	optional end time of alert, usually this is the observation end time	
			comment	string	optional	give more details regarding the alert	

*datetime expected in UTC and in the format(s): "YYYY-MM-DDTHH:MM:SSZ"

**units string format: Example: "MeV^-1*s^-1*cm^-2*sr^-1". Another example: "pfu" where 1 pfu = 1 s^-1*cm^-2*sr^-1

JSON filename guideline: ModelShortName.PredictionWindowStartTime.IssueTime.json

Profile text filename guideline: ModelShortName.PredictionWindowStartTime.IssueTime.EnergyChannel.txt

Please do not use colons (:) in your filenames