

TYPE - SH • APRIL 3 • MONDAY

International CCMC-LWS Working Meeting

3 3D CME **C** CME Arrival **F** Flares **Z** IMF Bz **H** Ionosphere **P** Plenary **R** Radiation **S** SEPs **1** SH **L** Solar-Helio

E Solar Indices

APRIL 3 • MONDAY

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- 3:00pm – 4:15pm **3 Joint session: IMF Bz; CME Arrival Time & Impact; and 3D CME kinematics and topology** Salons II & III (convention center)
- Where each team stands and what they want to achieve this week (10 min per team)
 - User needs (forecasting) - Rob Steenburgh (NOAA/SWPC)
 - Metrics needs from a scientific point of view
 - Goals for each team, discuss with participants
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- 3:00pm – 4:15pm **1 Coronal & Solar Wind Structure** Jamaica (main building)
- Discuss any practical operational metrics for the 4 sub-topics (Coronal Hole Boundaries, Coronal Structure, Ambient Solar Wind, Solar Wind Structure).
 - Start this discussion with some slides/input from forecasting agencies about their wish list.
 - Discussion on these specific metrics from the modelers and data providers perspective.
 - Brief intro on the IT framework we already have in hand from the SHINE Validation effort from a few years ago as a possible foundation for assessment.
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- 4:45pm – 6:00pm **Z Joint session: IMF Bz; CME Arrival Time & Impact; and 3D CME kinematics and topology** Salons II & III (convention center)
- Discussion of event selection and training/initial, validation, and test sets of events.
 - CME scoreboard discussion
 - Discussion about observational data used to validate models
 - Discussion about models inputs
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- 4:45pm – 6:00pm **1 Coronal & Solar Wind Structure** Jamaica (main building)
- Start Science Progress debate for the 4 topics
 - beginning with the CH and coronal structure topics ?
 - presentation of talking points received in advance of the meeting. Those in attendance can present their contributions.

APRIL 4 • TUESDAY

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- 9:00am – 10:15am **C CME Arrival Time & Impact** Jamaica (main building)
- Metrics*
- Metrics discussion and examples
 - Metrics addressing user needs vs. scientific research
 - Discussion questions
 - 1st set of events for validation
 - Preliminary model validation/results
 - Alex Wold: Real-time ENLIL run validation & discussion
 - Marilena Mierla (not attending): comparisons of ENLIL and EUHFORIA
 - More 2-3 slide contributions from participants
 - CME scoreboard discussion
 - Suzy Bingham: Initial CME scoreboard verification from the UK Met Office
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- 10:45am – 12:00pm **F Solar Flares** Jamaica (main building)
- Topic: Flare prediction methods & User Needs*
- Scene setting presentation (Sophie/Manolis)
 - Rob Steenburgh: Flare forecasts at SWPC and end-users.
 - Participants can give a 2-3 slide description of their method
 - Who uses flare forecasts? What do they care about? Large flares vs smaller flares? False positives? All-clear forecasts?
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- 3:00pm – 4:15pm **R SEPs** Jamaica (main building)
- Introduction and general discussion*
- Introduction: 2-3 slide contributions from participants introducing yourself, your interest in the SEP team, or slides related to any of the discussion items below.
 - User needs discussion
 - SEP scoreboard introduction
 - Validation for science vs. user needs
 - How to define: event, event duration, event start onset time
 - Which observations and derived quantities to compare against?

- Event selection discussion

4:45pm – 6:00pm	R SEPs	Jamaica (main building)
<i>Metrics Discussion (2-3 slide contributions from participants on any of the discussion items)</i>		
<ul style="list-style-type: none"> • What quantities to validate? <ul style="list-style-type: none"> • Onset time or threshold crossing time • Duration • Profile shape/rate of increase • Capturing SEP vs No SEP (all clear) • Which energy ranges, which thresholds? • How to compare models/methods <ul style="list-style-type: none"> • Model settings: Do some models need to be tuned for each event? Can they run for a long event period without parameter changes? • Reducing false alarms and misses • Which reference model or climatology to use? • Comparing models with different forecast types (deterministic vs probabilistic) • Collecting relevant models outputs for systematic comparisons (example: SEP scoreboard XML schema) • Observations <ul style="list-style-type: none"> • What observations are needed as SEP model inputs? • Models running on retrospective vs. real-time inputs • Incorporating radio observations 		

APRIL 5 • WEDNESDAY

10:45am – 12:00pm	3 3D CME kinematics and topology	Jamaica (main building)
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10:45am – 12:00pm	C CME Arrival Time & Impact	Salons II & III (convention center)
<i>Metrics & Impact of background solar wind</i>		
<ul style="list-style-type: none"> • Continue items remaining from Metrics session • Scene setting presentation on quantifying the effects of background solar wind • Discussion on impact of background solar wind, 2-3 slide contributions from participants • Continue other discussion items from previous sessions 		
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10:45am – 12:00pm	H Joint session: All Ionosphere Teams & Solar Indices Team	Martinique (main building)
Chair: Karin Muglach		
<i>Speakers:</i>		
Kent Tobiska (Space Environment Technologies, 30 min): "Solar proxies and indices for use in operations and modeling"		
Frank Eparvier (LASP, 10 min): "GOES-16 and Beyond: Measurements and Data Products from the new EUV and X-Ray Irradiance Sensors (EXIS)"		
Martin Snow (LASP, 10 min): "The MgII Index - the future begins now"		
Ed Thiemann (LASP, 10 min): "Irradiance Index Insights from the MAVEN and GOES-R Spectral Irradiance Models"		
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3:00pm – 4:15pm	F Solar Flares	Jamaica (main building)
<i>Topic: Validation metrics for flare prediction</i>		
<ul style="list-style-type: none"> • Discussion of different skills scores and categorical vs. probabilistic forecasts. • Discussion of how different metrics might be useful for different end-users or scientific use. • Jordan Guerra (not attending): ensemble prediction and discussion on what metrics should be optimized • Contributions from participants on metrics 		
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3:00pm – 4:15pm	Z IMF Bz	Salons II & III (convention center)
<ol style="list-style-type: none"> 1. Background Solar Wind Conditions 2. Core event selection 3. Magnetic What? (Rob Steenburgh: User Needs) <p>----- BREAK ----- (~3.40-3.50pm)</p> <ol style="list-style-type: none"> 4. B Magnitude threshold 5. Time resolution 6. Validation Metrics 		
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4:45pm – 6:00pm	F Solar Flares	Jamaica (main building)
<i>Topic: Fusion of flare prediction and validation methods toward the next generation of flare prediction capabilities.</i>		
<ul style="list-style-type: none"> • Action items for the future relation to the Flare Scoreboard (validation; XML file; metadata) • Event selection, choosing active and quiet time periods (make sure there is HMI / other data availability for modelers). • Future: collect model outputs for these periods - jointly validate. 		

4:45pm – 6:00pm

1 Coronal & Solar Wind Structure

Salons II & III (convention center)

- Discuss science progress for the ambient solar wind and solar wind structure topics

APRIL 6 • THURSDAY

10:45am – 12:00pm

3 3D CME kinematics and topology

Salons II & III (convention center)

10:45am – 12:00pm

R Joint Session: SEPs; SEEs; Radiation Effects for Aviation; Total Dose

Jamaica (main building)

- Discussion of user needs for each team's topic area
- Event selection, finding a common event period for initial study

1:30pm – 2:45pm

1 Solar Indices and Irradiance

Bermuda (main building)

2:00pm – 3:00pm

F Open house/Q&A

Salons II & III (convention center)

This time has nearly no overlap with workshop sessions and provides participants an opportunity to ask questions/discuss with team leads.

Teams leads at open house: Solar Flares, IMF Bz.

3:00pm – 4:15pm

Z IMF Bz

Salons II & III (convention center)

1. Summary of Previous session.
2. Complete actions items from previous session
3. THE FUTURE: ARL positioning for Bz actions
- BREAK ----- (~3.40-3.50pm)
4. THE FUTURE: CCMC Bz Scoreboard?
5. THE FUTURE: Improve interfacing between R2O with O2R?
6. THE FUTURE: Open-Mic Action items (+Congratulate ourselves for a job well done)

3:00pm – 4:15pm

1 Coronal & Solar Wind Structure

Jamaica (main building)

Pulling it all together, and developing a plan of action for the next 6-12 months.

4:45pm – 6:00pm

C CME Arrival Time & Impact

Salons II & III (convention center)

Summary and future plans

- Remaining discussion questions
- Quantifying progress in the field of CME arrival & impact
- Summary of team progress
- Future plans, meetings, remote collaboration

4:45pm – 6:00pm

Z IMF Bz

Jamaica (main building)