

UM CLaSP solar forecast team



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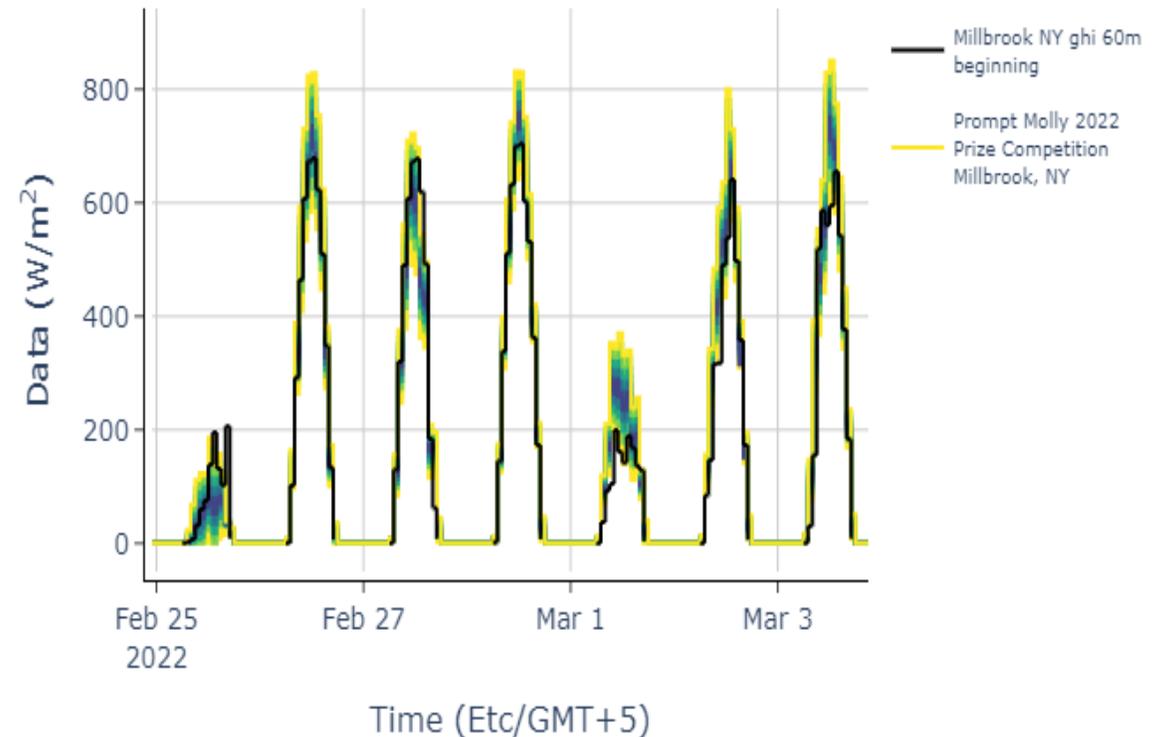
A hybrid approach for intra-day solar forecasting

Two facts and considerations

- Solar forecasting is closely related to the weather forecast: the amount of solar radiation reaching the solar panel is dominantly affected by cloud evolutions dictated by weather system development.
- Data-driven algorithm is most effective when its design and refinement are guided by known physics, in this case, our best understanding of weather system evolutions.

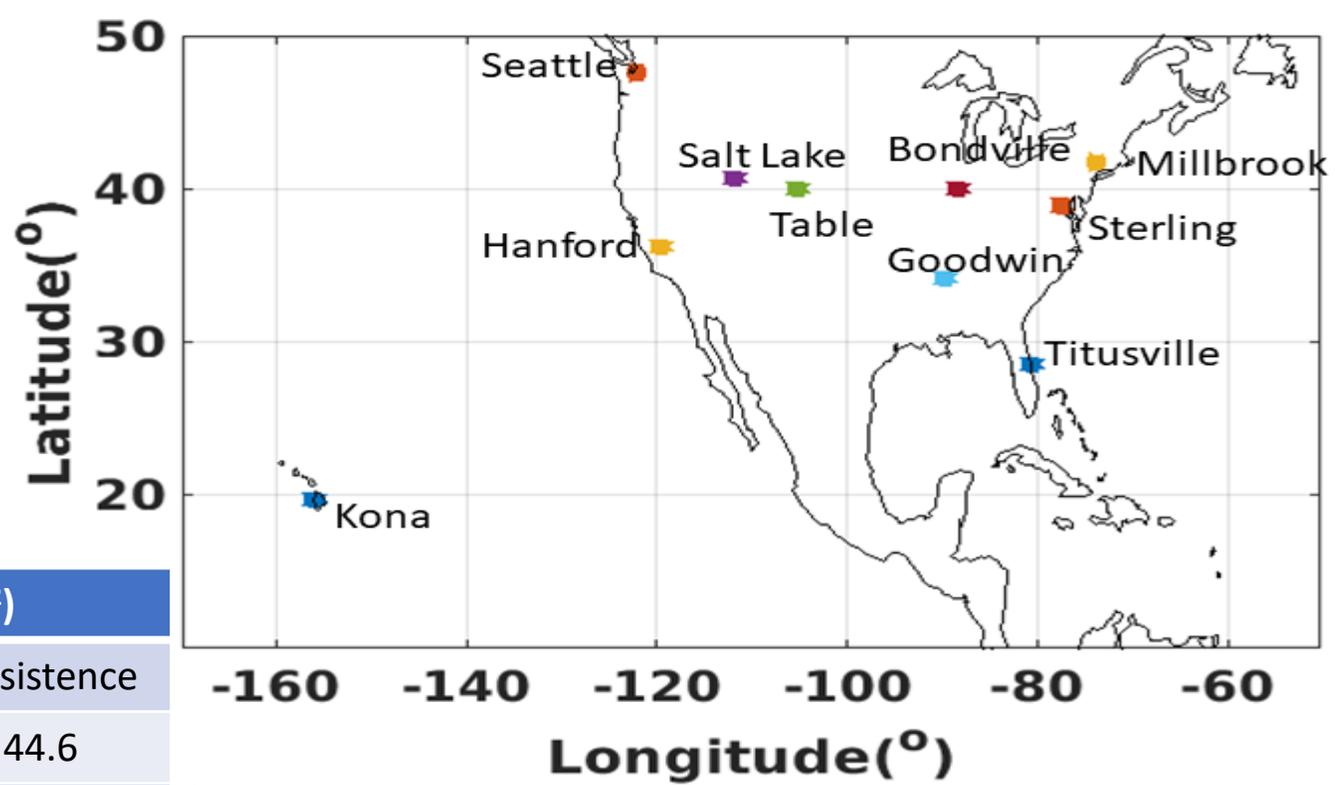
A hybrid forecast of the next 24-48 hours of ground horizontal irradiance based on

- Recursive neural network (RNN), trained with past observations
- A weather-regime-dependent empirical bias correction scheme based on the RNN output and the multi-day weather forecast made from numerical weather prediction (NWP)



Lead time: 24-48 hours

Out of 10 sites



				CRPS(Wm ⁻²)	
	Station	State	CRPSS	Our model	Persistence
1	Kona	HW	0.027	43.4	44.6
2	Seattle	WA	-0.056	72.4	68.5
3	Hanford	CA	0.446	36.7	66.3
4	Salt Lake	UT	0.199	58.2	72.7
5	Table Mountain	CO	0.231	63.7	83.3
6	Goodwin	MS	0.435	60.8	108
7	Bondville	IL	0.299	61.7	88.1
8	Titusville	FL	-0.038	76.1	73.3
9	Sterling	VA	0.484	47.6	92.3
10	Millbrook	NY	0.418	51.3	88.2

