



Comparing WRF, AROME IFS AND GFS Irradiance Forecasts in French Guiana

Diallo Mouhamet (1), Seyler Frederique (2), and Linguet Laurent (1)

(1) French Guiana university, France (mouhamet.diallo@ird.fr), (2) IRD – UMR Espace-Dev

The world current energetic model relies primarily on fossil fuel powered electricity. This energy carrier is unsustainable and expected to be depleted by 2212. French Guiana started recently its energy transition; the 2014 PV installed capacity will be increased by 111% by 2023. To integrate such variable energy amount into the electricity grid and guarantee its stability, requires accurate weather conditions forecasts.

The objective of this study is to compare the 36 h solar irradiance forecast of four (WRF, AROME, GFS, IFS) numerical weather prediction models (NWP) in French Guiana to allow higher penetration of intermittent solar renewable energy. Each models accuracy is validated by comparison with hourly data of global horizontal irradiance (GHI) measurements for three months and from six stations of the French national weather services. Chosen months represent the dry, rainy season plus one month describing the latency period between the Inter Tropical Convergence Zone southward to northward motion over French Guiana. We used the root mean square error (RMSE), mean bias error (MBE), and the forecast skill (FS) to assess the GHI forecast accuracy. This study is on-going, preliminary results show that WRF initialized with GFS have better RMSE and MBE than GFS. To conclude, this study gives knowledge on the GHI forecast accuracy of current NWP models in French Guiana tropical climate. This knowledge is vital to monitor and predict the yield of solar energy systems and their input into French Guiana electricity grid as the solar energy potential of tropical areas can be up to three times higher than that of extra-tropical countries but much variable due to the dynamic cloud cover.