

SUPPLEMENTARY MATERIAL (1/3): DATA STATISTICS

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In this material, we provide statistical analysis from the data. This analysis was used to construct appropriate SDE models.

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1. Seasonality effect. To guaranty an homogeneous year, we study the Mean Absolute Error (MAE) for each provider and for each day. In Figures (1), (2), and (3), we can see the daily and weekly MAE for the providers A, B, and C, respectively.

To compute the vector that we are piloting, we realize the operation

$$\hat{V}(j) = \frac{1}{145} \sum_{i=1}^{145} |V(i, j)| \quad \text{where } j \in \{1, \dots, 147\}.$$

Recall that $V(i, j)$ is the normalized error between the ADME real production and the UTE forecast at time i and for the day j .

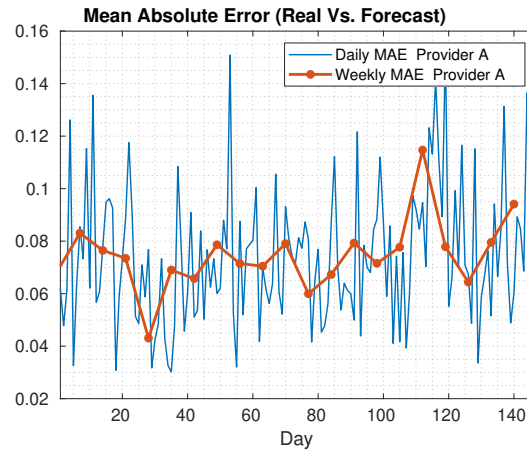


FIG 1. Daily and weekly for the provider A.

Keywords and phrases: Wind Power, Probabilistic Forecasting, Stochastic Differential Equations, Lamperti Transform, Numerical Optimization, Model Selection, Time-Inhomogeneous Jacobi Diffusion

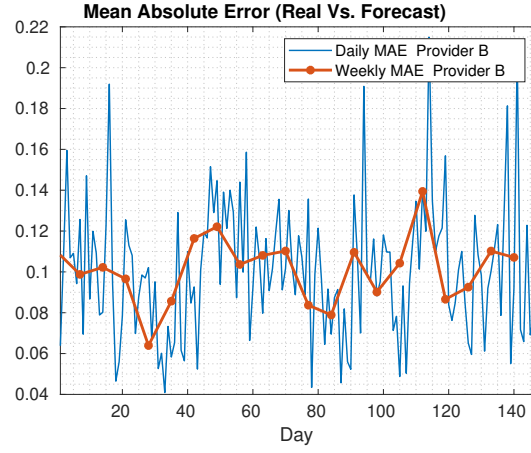


FIG 2. Daily and weekly for the provider B.

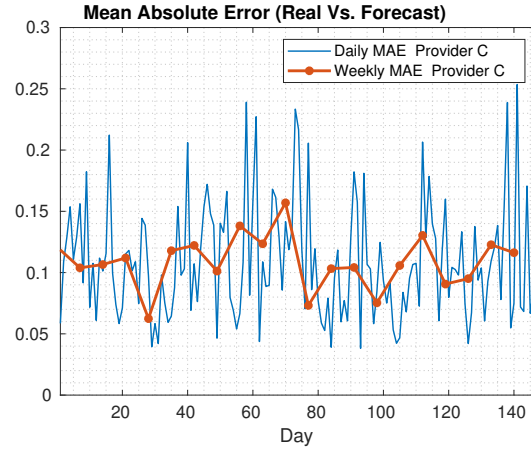


FIG 3. Daily and weekly for the provider C.

2. Hourly effect. We want to see the error throughout the day. We compute the MAE for each provider for each measurement during the day. In Figures (4), (5), and (6), we can see the hourly MAE for the providers A, B, and C, respectively.

To compute the vector that we are piloting, we realize the operation

$$\hat{V}(i) = \frac{1}{147} \sum_{j=1}^{147} |V(i, j)| \quad \text{where } i \in \{1, \dots, 145\}.$$

Recall that $V(i, j)$ is the normalized error between the ADME real production and the UTE forecast at time i and for the day j .

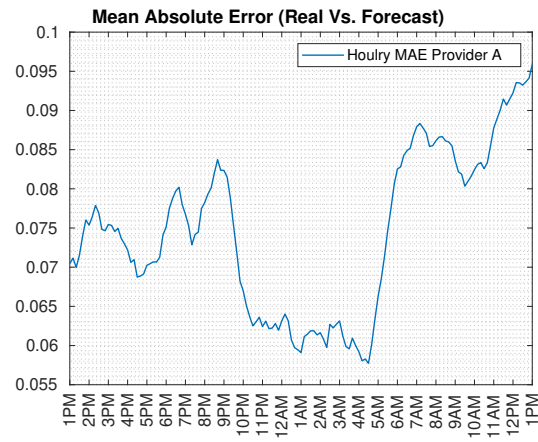


FIG 4. MAE along the day for the provider A.

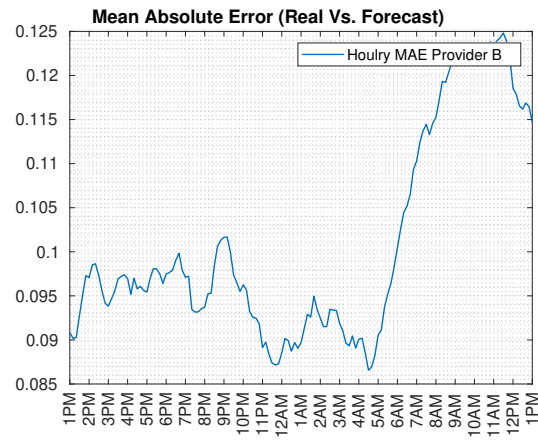


FIG 5. MAE along the day for the provider B.

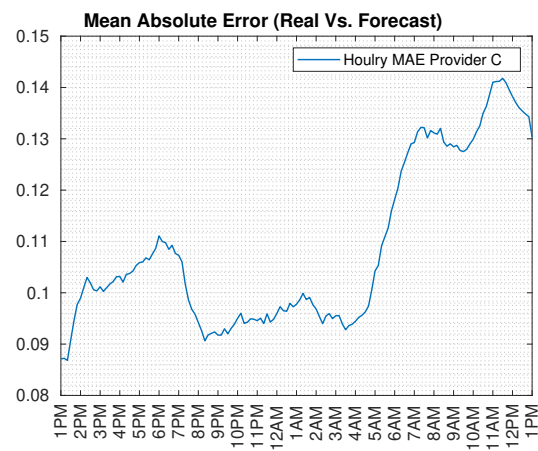


FIG 6. MAE along the day for the provider C.

3. Forecast Error Vs Forecast:. We plot the forecast error as a function of the forecast value for each provider. In Figures (7), (8), and (9), we can see this plots for the providers A, B, and C, respectively.

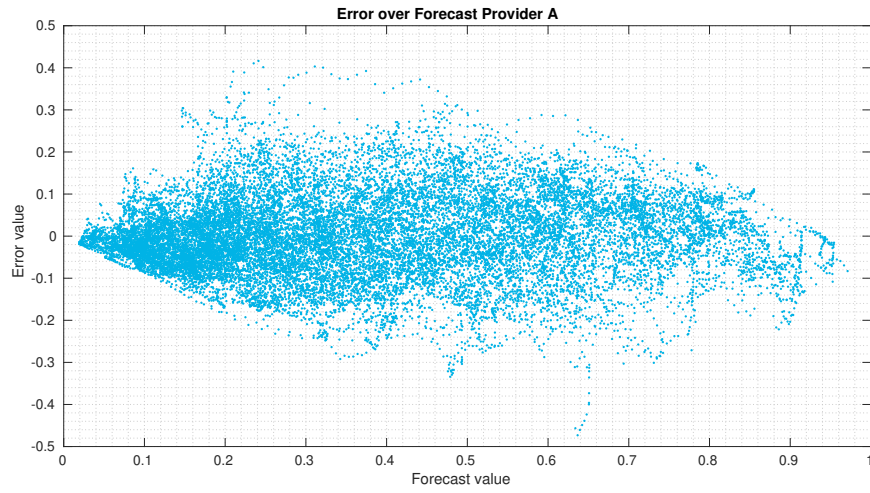


FIG 7. MAE along the day for the provider A.

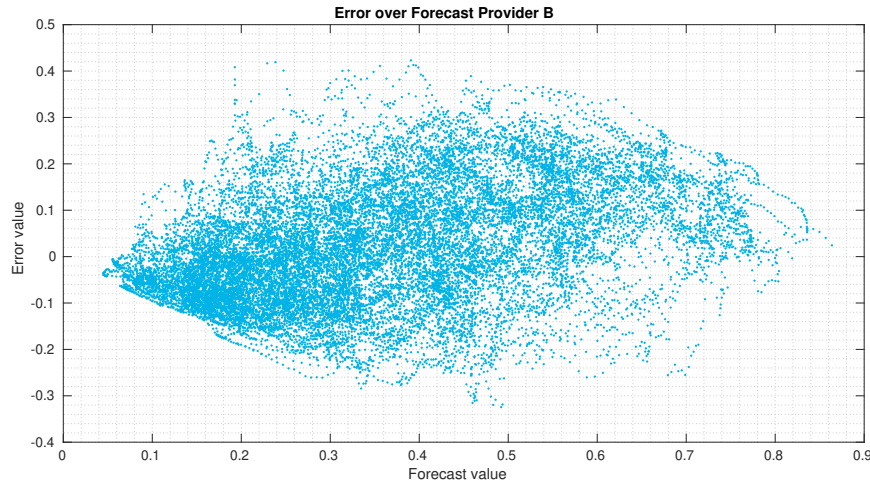


FIG 8. MAE along the day for the provider B.

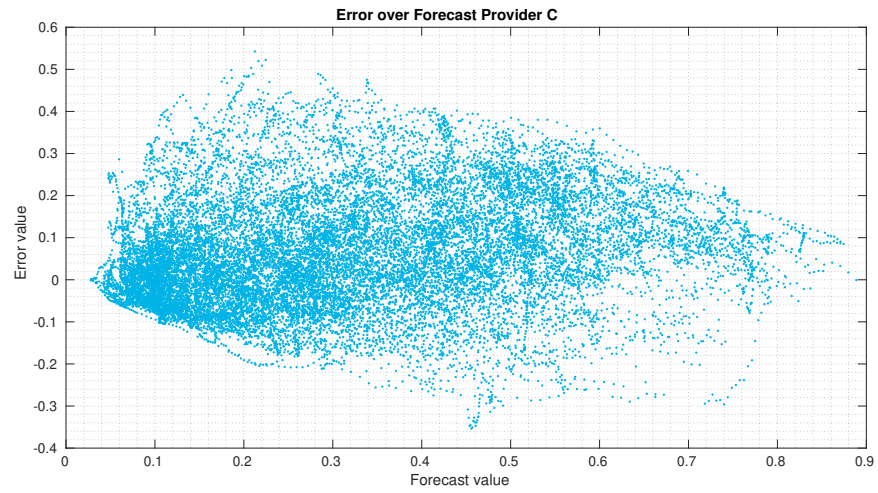


FIG 9. MAE along the day for the provider C.