ESTIMATION OF AEROSOLS AND AIR POLLUTANTS USING ARIM TIME SERIES MODEL OVER TALCHER COALFIELD OF INDIA

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[03].[Atmospheric aerosol and clouds properties] [Tuesday], [UTC 12:00] [Tuesday_03_P15]

The 30th International Laser Radar Conference (ILRC) virtual conference, June 26th – July 1st, 2022.

Instrumentation, dataset and analysis

The air pollutants samples were collected over the Talcher coalfield site at Odisha, India.

The major air pollutants ($PM_{2.5}$, PM_{10}, NO_2, NO_X, CO, O_3, and SO_2) for the period of January 2019 to May 2021.

The present study tries to implement univariate time series Auto Regressive Integrated Moving Average (ARIMA model.

Results

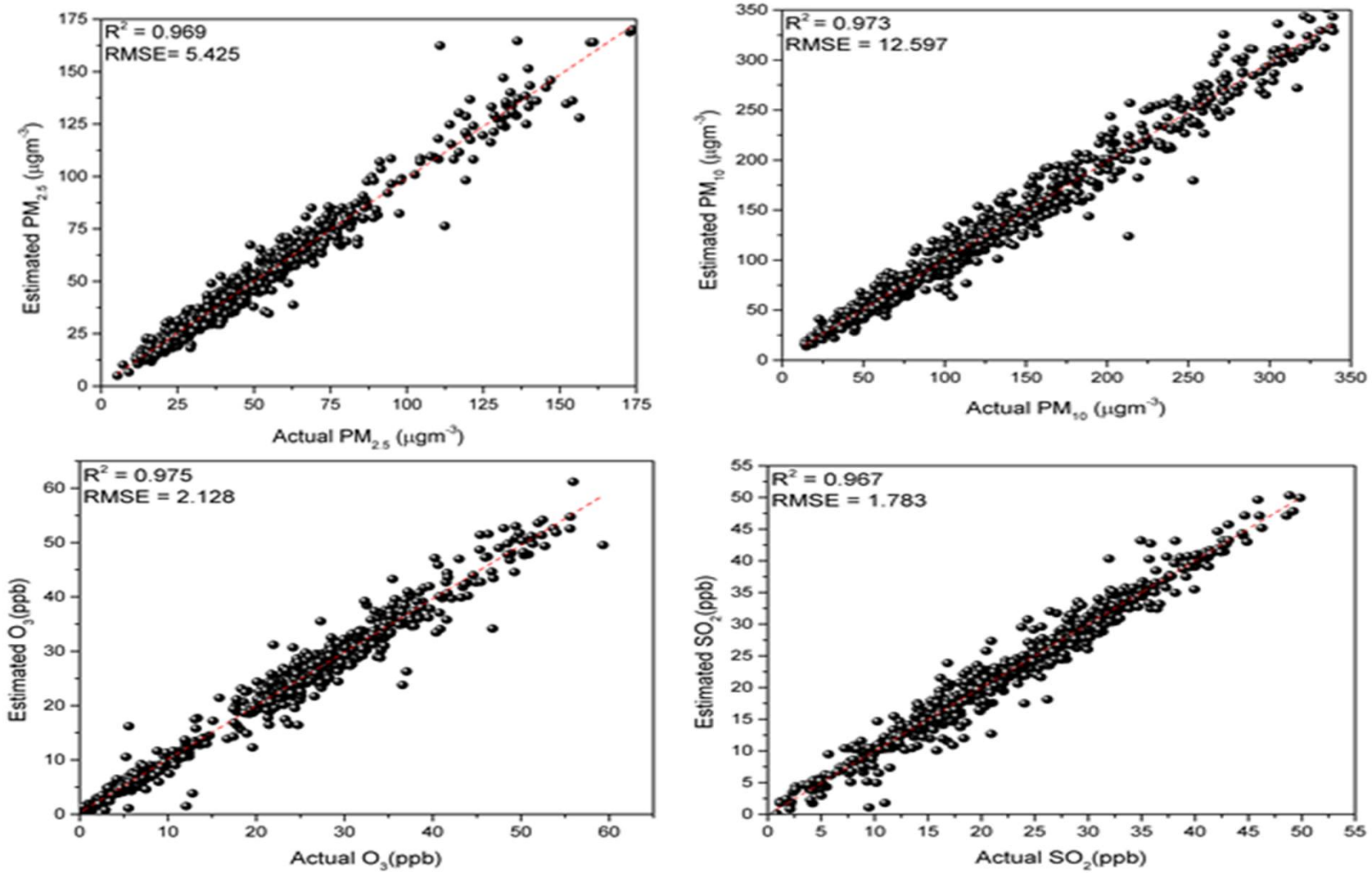

Figure: scattered plot of $PM_{2.5}$ PM10, O3, SO2 ARIMA (3, 1, 3) estimated and observed dataset

Results

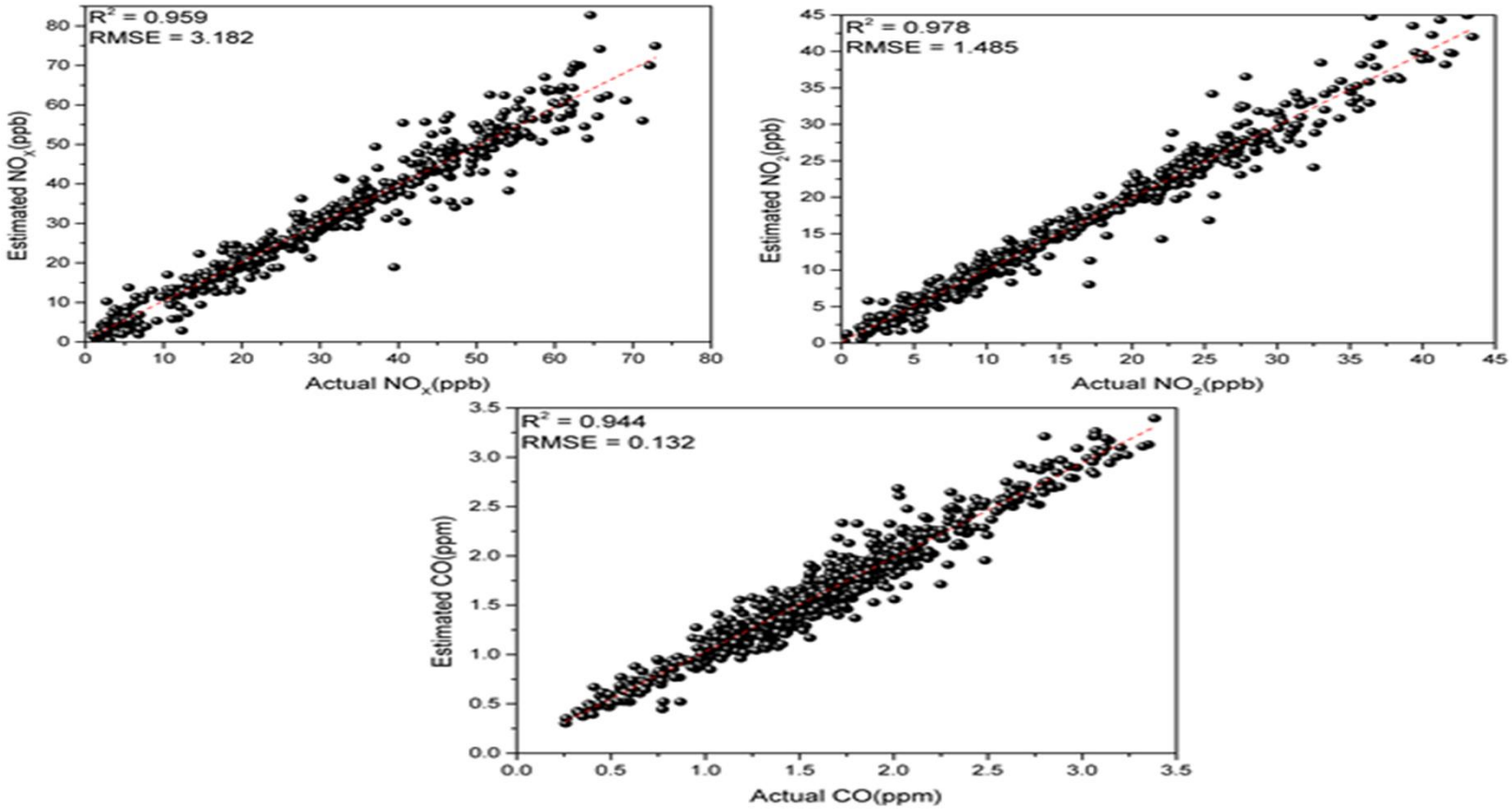

Figure: scattered plot of NO_x NO2, CO ARIMA (3, 1, 3) estimated and observed dataset

Conclusions

- This ARIMA (3, 1, 3) model shown robustness over more than 25 combinations.
- Different combinations of experimental results demonstrate significant Coefficient of determination (R^2) and root me
square error (RMSE) for each pollutants.
- Overall best estimated $R^2 = 0.978$ value was found for NO_2 using ARIMA model.
- The air pollutants estimated results using ARIMA model showed reasonably good agreement with the actual datasets.
- The outcomes demonstrate that the proposed time series model has promising accuracy for estimating air quality.