Universiti Teknologi MARA

Assessment of Ozone (O_3) Functional Data Analysis in Miri, Sarawak

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

Developing countries cannot be spared the presence of poor air quality due to rapid technological change. On the other hand, it also causes new and growing health problems. However, over the decades, this has been a persistent issue as many people are still ignorant of it. According to Shaadan, Deni, & Jemain (2012), a geographical area, a high level of industrial and commercial activity, a high-density population, heavy-duty vehicles, and others are responsible for poor air quality. Therefore, this study is conducted to assess the functional curve of ozone, O_3 behavior at a monitoring station in Miri, Sarawak, Malaysia. Functional Data Analysis (FDA) is used in this study because it can produce a model that can be continuously represented as a smooth dynamic. This also enables precise estimation of the parameters to be used in the analysis process, an efficient way of reducing data noise by curve smoothing and useful for data with various sampling schedules. In this study, the results of the analysis revealed implicit information on the existence of two significantly different O_3 behaviors between 2014 and 2015. The results showed that anomalies were detected in the first half of 2014, while anomalies were not detected in 2015. This showed that the diurnal behavior was influenced by the various dominant emission sources and other methodological conditions that existed in those years.

Keywords: ozone, functional curve, Functional Data Analysis (FDA), curve smoothing, anomalies

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