Comparison of Respirable Particulate (PM$_4$) Measurements from Direct-Reading Photometric Instruments and a Gravimetric Sampling Method

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### Introduction

Problem Statement

Objectives

Methodology

Results

Limitation

Conclusion

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<thead>
<tr>
<th>Source</th>
<th>Cal. Factor</th>
<th>Environment</th>
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<td>Braniš &amp; Hovorka</td>
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<td>Jiang et al. (2011)</td>
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<td>McNamara et al. (2011)</td>
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(Adapted from TSI Inc., 2013)

NLA Test & Measurement Conference 2015
Kwadela, Mpumalanga

Key:
- Kwadela Built-up Area
- Railway Line
- N17 National Route
- Secondary Route
- Indoor Sampling Sites
- Gravimetric Sampling Sites

South Africa

Lab: Pre-Sampling

Lab: Post-Sampling

Data Analysis

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Experimental Design

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Field Sampling

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Data Analysis

DustTrak II Model 8530

SidePak AM510

GilAir 3 Pump

Dorr-Oliver Cyclone

37mm Cassette
Photometric Calibration Factor

\[
\text{Gravimetric Conc. (Cur. Cal. Fac.)} = \frac{\text{Instrument Conc.}}{\text{Lab: Pre-Sampling}}
\]

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Experimental Design
Lab: Pre-Sampling
Field Sampling
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Data Analysis
• DustTrak II Model 8530
• 0.14 ± SE (0.09, 0.15)
• Winter 2013: 1800 µg/m³ – 252 µg/m³
• SidePak AM510
  • **0.24 ± SE (0.16, 0.30)**
  • **Winter 2013: 500 µg/m³ – 120 µg/m³**
Thank you