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*Abstract*

# Experimental evaluation of the repeatability of wind tunnel measurement of cyclist's drag

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## 1. Introduction

In the field of cyclist's drag estimation, the most used method is the wind tunnel, which is the gold standard thanks to its reliability.

However, to the best of our knowledge, there is no available work investigating the actual repeatability of the drag estimation by this technique. More specifically, no experiment seeks to establish the repeatability of the drag measurement from end to end, in particular by taking into account the capacity of the cyclist to reproduce or maintain a position in motion or not.

The work described in this paper intends to make a significant contribution in this field. In order to study the repeatability of wind tunnel, we carried out different measures: repetitions of measurements without the cyclist moving; repetitions of measurements without the cyclist moving, cutting the wind between each measurement; repetitions of measurements with the cyclist resuming his position between each measurement; repetitions of measurements with the cyclist resuming his position and cutting the wind between each measurement.

All its measurements were made for two wind speeds (30 and 50 km/h).

We present the end-to-end repeatability of drag measurements in a wind tunnel and analyze the contributions of different phenomena influencing the variability of the measurements.

**Keywords:** cycling, aerodynamic, wind tunnel, metrology