

Interactive comment on “Air Density Induced Error on Wind Energy Estimation” by Aurore Dupré et al.

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First of all, the authors would like to thank the referee for his comment.

This study targets small structure like wind energy producers with small wind farms. Typically, this work was conducted thanks to a wind energy producer who owns 6 farms with six wind turbines each. Then, the forecast accuracy is vital. In this context, the impact of density variations on the wind power modeling is accurately quantified using in-situ measurements over 3 years. The use of in-situ data, especially over such a long period of time, is rare in the literature and that is one of the strengths of this work. Indeed this work focus on the impact at one wind farm. But the second part, about the spatial study and the part on power output modeling can be combined to get an idea of the spatial impact. Unfortunately, we do not have access to wind farms data exposed to widely differing air density. But the period of time over which this study is conducted

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is sufficient to guarantee the robustness of this work.

We use the simplest method in order to demonstrate that even this naive approach allows significant improvements (up to 40%). The literature review presents the other methods and their associated improvements even if the comparison with the IEC normalization is not systematic (making comparisons difficult). In any case, the literature review has been expanded thanks to the referee's comments.

In the first part of the paper we use in-situ measurements of pressure and temperature to compute the air density through the following formula: $\frac{MP}{RT}$ where M is the molar mass of dry air and R is the ideal gas constant.

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