

Review

General comment:

The main objective of the paper is to present a comparison of the wind turbine response in a Gaussian mixture distribution function and common unimodal distribution functions. The paper is well organized, and the distribution procedure is described clearly.

There are general notes as follows:

- The nominated distributions for the comparison include just three general distributions. The process or reason behind these distributions is not clear. As GMM has several parameters, it is expected that it has better GoF (Goodness of Fit) compared to simple two- or three-parameter distributions. In order to have a fair judgment, it is expected that mixture probability density functions such as GEV-Weibull or Weibull-Weibull are used in the comparison process. A list of such distributions is presented in the paper by Jung (<http://dx.doi.org/10.1016/j.enconman.2016.12.006>).
- The authors used two random seeds in simulations. Different random seed numbers have an effect on the response of the turbine and, consequently, on the distribution of the extreme loads. That is why the IEC has a recommendation for the minimum number of seeds at different wind speeds. The number of seeds should be justified at least by a reference or with sensitivity analysis, as it is in contrast with IEC regulation for ultimate analysis (Annex G of IEC).
- There are several places where authors claim a statement without a related reference. Some of the examples are stated in specific comments.
- As the authors used load data from a previous publication, it is worth mentioning the DLCs that are included in the referenced publication in order to clarify the load's condition for the reader.
- As a reader, in the result section, the superiority of using GMM is not established clearly. For example, it seems the results in Table 1 are, to some extent, close.

Specific comment:

1. In Section 1, line 20, the sentence "*Using crude MCS for analysis with such low probabilities requires at least ...*" needs to be referenced.
2. In Section 1, line 43, the sentence "*An improper distribution could result in a far-off extreme load prediction*" needs to be referenced. Is there any study that shows how much the results change with improper distribution?
3. In Section 1, line 54, the sentence: "*Fitting wind turbine extreme response with unimodal distributions directly 55 will have a large estimation error at both the center and the tail distribution*" needs to be referenced.
4. In Section 3, line 96, it doesn't mention what MSE stands for. It is mentioned later in Section 4.2, but for readers, it should be cleared the first time it is used.