Response to Reviewers' Comments (WES-2022-70)

Specific comments

• Equation 4 is now restricted to positive wind speeds, as it should. However, the integral of this will be less than one when the offshore parameter is negative, so it is not a proper probability distribution. You can repair this by adding a finite probability of calm wind speed, see below.

Response: The authors would like to thank the reviewer for working out and recommending a proper probability distribution to encounter the situation when the shift parameter is negative, which can be used when a significant loss in the integral value. The authors have incorporated the probability distribution as suggested (please see Equations 6-7) in the revised manuscript as a solution to those researchers who get the integral value considerably less than 1. In this paper, although the shift parameter is negative for all the sites, all the integral values are very close to 1, which is supposed to be the actual value, and the percentage deviation from the actual value is only 0-1.7% in the MLE estimate, and 0-1% in the Bayesian estimate, which is insignificant as shown below:

Table: Integral values of 3-parameter Weibull with MLE Estimate

Site	k	A	θ	Integral value ($x \geq 0$)	Deviation from actual value (%)
1	2.777792	6.438856	-0.380611	0.99961	0.0
2	3.233794	7.532297	-0.922046	0.99887	0.1
3	2.636074	8.804806	-1.546749	0.98984	1.0
4	2.401323	8.493057	-0.042536	0.98339	1.7
5	2.569510	8.596043	-0.323893	0.99978	0.0
6	2.522584	7.896873	-0.047855	0.99999	0.0
7	2.425388	7.807676	-0.603869	0.99799	0.2

Table: Integral values of 3-parameter Weibull with Bayesian Estimate

Site	k	A	θ	Integral value ($x \geq 0$)	Deviation from actual value (%)
1	2.778195	6.43967	-0.381144	0.99961	0.0
2	3.231943	7.528328	-0.918508	0.99888	0.1
3	2.63585	8.804653	-1.546999	0.98983	1.0
4	2.405809	8.507469	-0.055714	0.99999	1.7
5	2.569184	8.596434	-0.324597	0.99977	0.0
6	2.52374	7.90074	-0.051032	0.99999	0.0
7	2.425984	7.808854	-0.604597	0.99799	0.2

• I am happy about the changes to equation 21-25 and table 8. However, it would be better to substitute the term 'available power' by 'wind power density', which is standard in wind energy.

Response: ‘available power’ has been substituted by ‘wind power density’ as suggested.

• Figures 1-3 shows the variations of repeated Bayesian estimators. This information is necessary for the reader.

Response: This information is now added in the revised manuscript in the Results section.

• Figures 5-11 compares fitted distributions with bin statistics of wind speeds at six met masts. It seems unnecessary to include this many similar plots, especially since tables 4 and 5 summarises key statistics.

Response: Based on the above suggestion, only four fitted distributions are retained and three are deleted.

• It would be relevant to compare the times of computation by the Maximum likelihood method and the Bayesian fitting by JAGS. The results are very similar, but what about the efficiency?

Response: The computation times taken for the 2-p and 3-p methods for site 1 are shown in the table below. However, a direct comparison of the computational time would not be appropriate as the Bayesian method is a simulation based technique which take longer time than the standard software based MLE technique. A statement regarding this now added in the revised manuscript.

	Computation Time	
	MLE	Bayesian
2P- Weibull	approx 1 min	approx. 24 min
3P- Weibull	approx. 2 min	Approx. 34 min

Technical comments

• The manuscript should explain why some numbers in tables 4, 5 and 7 are printed with bold.

Response: The values that are highlighted are the best goodness of fit/error estimates. It can be seen from the highlighted values that the 3P method is performing better.