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Interactive comment on "Assessing Spacing Impact on Coherent Features in a Wind Turbine Array Boundary Layer" *by* Naseem Ali et al.

Anonymous Referee #2

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The paper applies POD and Barycentric color map to analyze the wake field in an array of wind turbines with different spacing. The paper is generally well-written (though some grammatical errors do exist). The POD analysis provides insights into the dominant structures in the wake field, which ultimately will be valuable for finding reduced order models for the wakes. The barycentric map highlights the specific anisotropic features in the wakes, which again will be useful for gauging models for the wakes. The analysis is sound and reasonably complete. I recommend publication with minor corrections. Some specific comments are listed below:

Line 89: From this line, am I correct to understand that the POD is applied to the fluctuating velocity only, meaning the mean velocity is subtracted first? Some clarifications are needed.

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Page 5: Eq (2) contains typo. In the next sentence (line 94) $R(x,x')$ was referred to as if it appeared in Eq. (2). However it is not there. Also, the locations x and x' should have an arrow on the top to be consistent.

Line 97: it would be more helpful to explain the relation between G and the coefficients A in Eq. (1).

Line 102: the running index in the summation on the top should be different from n, as n is the upper bound of the summation.

Line 108: Please give the definition of k.

Line 115: 'to additional promote the study of...'? It does not quite make sense.

Line 129: I suspect that the C^*_{ic} inside the parentheses should not have the asterisk. Also, the coefficients 5 and 0.65 are different from those in Emory and Iaccarino. Some explanation is needed.

Line 162: 'represent aligned wind farms' and 'is not considered'.

Line 173: the typesetting of the expression 0.2m x 0.2m is a bit awkward, thought I suppose this can be fixed by the publisher.

Line 239: 'reduction of the streamwise spacing'

Fig. 8: It seems that, apart from case C3X3, the upstream structure is very much different from the downstream one. Can the authors please comment? This part represents a main contribution of the article. It is important to give an in-depth analysis.

Line 279: Should be 'the intermediate modes are associated with the inflow characterizations'?

Line 354: Fig 12 should be Fig 13

Line 422: '...streamwise spacing exceeds and reconstruct faster...'? Something is missing here. It does not quite make sense.

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