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Interactive comment on "A new methodology to train fracture network simulation using Multiple Point Statistic" *by* Pierre-Olivier Bruna et al.

Anonymous Referee #2

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1) This paper presents a specific application of multipoint statistics to generate synthetic non-stationary 2-D DFN models. 2) I don't think that this is the _first_ application of MPS - I seem to remember a number of authors using e.g., SGEMS for generating conditioned fracture fields. 3) It is greatly appreciated that the paper clearly explains the limitations of the approach, particularly problems in identifying longer fractures. In addition, there are problems in 3D extrapolation, non-planar features, and termination modes. 4) In evaluating the generated DFN's, it would be appropriate to quantitatively compare the statistics of generated vs training DFN's in terms of:intensity spatial distribution as P21 m/mˆ2, orientation distribution for each set, and size (trace length) distribution, and termination modes . 5) I don't understand why the engineering aspects of the project (i.e, using Barton's empirical relationship to define aperture, geomechanical

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Discussion paper

and flow simulations)- are included in the paper. This is a theoretical algorithm paper, not a case study. Perhaps the engineering portions can be put in a separate paper ? 6) I would appreciate more details on the specifics of the MPS implementation. I don't think that the algorithm could be reproduced by others with just the details provided in the paper. How is MPS used to vary fracture intensity ? trace length ? orientation ? How is MPS used to for different sets , or are the sets completely independent models ?

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