Metamodeling of Dynamic Nonlinear Structural Systems through Polynomial Chaos NARX Models

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The authors present a metamodeling method for the upscaling of refined computational models. The paper is well written and properly structured and addresses a novel approach. In my opinion it will be interesting for the readership of the Journal and thus in my opinion merits publication.

Before final acceptance, the authors in a revised version should clarify the following:

1. It is not clear if and furthermore how is one able to derive information on a specific quantity of the actual structure (e.g. a stress-resultant or a stress measure) from the metamodel data. For example, is one able to reproduce the hysteresis loop presented in Figure 16 from the metamodel response?
2. It seems that all comparisons are performed with respect to numerical simulations that were used for the identification of the metamodel parameters. Will the performance of the method remain similar if a different excitation is used that has not been part of the initial experiment set. The authors should add a comment clarifying this.
3. The authors should also comment on the sensitivity of the method in regards to the measured data used for the identification of the metamodel parameters. For example, the velocity of node 7 is used in Section 3.2. Is there a rationale for the choise of the output parameters?
4. In Figures 7 and 13 the actual response is compared to the metamodel one by presenting time-histories. Although these figures are instructive the authors should also present corresponding time-history divergence plots.
5. In Figure 16, a hysteretic loop is presented where data sampling is rather course. Are there problems related to this, or the method can handle such information that can also be an actual measurement scenario. Please comment also on this.