Review of: "On Optimal Linear Prediction"

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The paper tackles optimality in terms of mean square error prediction for model reduction, specifically focusing on Partial Least Squares. The proofs build on quantum mechanics approaches to the estimation of accessible variables, thus providing an inter-disciplinary point of view on linear prediction.

The flow could be improved in some spots: (1) why are Definitions 1, 2, and 3 after Theorems 1 and 2 if they are needed for the theorems?; (2) Theorem 7 is mentioned before being presented; (3) the proof of Theorem 12 should be made explicit because it is not trivial and seems a major contribution. As far as the language is concerned, it sometimes reads too much like a dialogue: (1) it is preferable to avoid starting sentences with “but”; (2) avoid concluding a sentence with “, say”.

To improve the readability of the paper, I suggest to (1) extend the bibliography for domain-specific terms such as orbit, or briefly introduce them; (2) add a reference for Born's formula; (3) make the discussion more cohesive by using quantum mechanics as the fil rouge, e.g., highlighting where the quantum mechanics methods play a role in the various proofs that appear in the paper.