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Geoscientific Model Development Discussions

Interactive comment on "Implicit-explicit (IMEX) Runge-Kutta methods for non-hydrostatic atmospheric models" *by* David J. Gardner et al.

Anonymous Referee #2

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This is a well done study in my opinion and I have very few suggestions.

1- In general I submit that conservation is important as well and might be a relevant criterion to be added to the list of properties. Not all methods are conservative: e.g., ARS222. Some discussion is in Giraldo et al. (2013). That imposes additional constraints on the conservative methods. Some methods in Weller et al. (2013) and Lock et al. (2014) may not be conservative.

2- Page 3 top; one-dimensional IMEX in NUMA is more or less equivalent to HEVI. Perhaps that can be stated.

3- Page 11 bottom (line 28): no communication only when the partition is done by vertical columns.

4- Page 20, lines ∼25-30: I'm surprised by the SSP performance, I am not sure that the coupling is the issue because most of them have the same coupling order. This could be speculative, but not a bad guess. However, I agree with the eigenvalue distribution argument.

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