

Interactive comment on “Direct numerical simulations of particle-laden density currents with adaptive, discontinuous finite elements” by S. D. Parkinson et al.

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In finite differences, one grid point = one degree of freedom (per variable), independent of the order of accuracy used.

Parkinson et al use 10^7 adaptive elements. Espath et al use 10^7 fixed uniform grid points. You get similar results. So the 6th order FD scheme of Espath must be a lot more accurate as a function of Δx since their Δx must be a lot larger where your refinement criteria tell you to refine the mesh. So their scheme is (probably) cheaper and gives similar accuracy. But not so good for complex geometries.

Another point, you use the phrase "traditional FE model". Would it be more precise to
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say "fixed, uniform mesh FE model".

Interactive comment on Geosci. Model Dev. Discuss., 7, 3219, 2014.