

## ***Interactive comment on “Syn-eruptive, soft-sediment deformation of dilute pyroclastic density current deposits: triggers from granular shear, dynamic pore pressure, ballistic impacts and shock waves” by G. A. Douillet et al.***

**Anonymous Referee #2**

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This work is well written and illustrated, and well referenced. It constitutes a very useful synthesis of a range of features drawn together to emphasize the richness of information that can be derived from soft-state deformation structures. The interpretations are mostly fully explained and sensitively justified. The authors should, however, revisit their inferences regarding relations of flow unsteadiness and non-uniformity vis a vis dynamic (flow) pressures and deposit (pore) pressures, including justification for inferences concerning accumulative vs depletive currents. This is an important field and the work transgresses into speculation here. Better to pose the question than to conjure

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an answer. The following list is mostly of minors and some suggested wordings:

Title could move subject; less clumsy perhaps : ...deformation of deposits from dilute. . .

1,47 and they reveal

2,66 contraint

2,71 ‘metastable conditions’ meaning what? Typically they are both unsteady and non-uniform, but be clear how this favours SSD. Do you mean rapidly changing capacity?

2,88 poor topic sentence. Triggers of SSD are various. . . 89- reduce reference to special issue.

2,108 I like “potatoids” but suspect this is no more helpful than pseudonodule; irregular rounded bodies?

2,114 towards the parent flow is interpretative and not simply descriptive.

2, 122-3 inv commas correct, here and throughout?

3,165 into 4 end-member types

3,188-9 characteristics . . . results Sort out subject verb; presumably characteristic [singular]

3,236 On the other hand, sheet

5,321 minutes comma

5,327 sort out after craters”. . .

5,338 delete in

5,365 structure comma

7,415 doesn’t make sense; ?properties that account for initiation of deformation?

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7,437 Water would enhance cohesion but the concept, as stated, of overweight due to water is too simplistic; needs some elaboration

8,478 what is 'the latter'?

8,486 del triggered ?caused

8,504 vortices may be cryptic (hidden) in sedimentary records; anecdotal doesn't make sense (to me anyway)

8,527 subject verb number confusion; is also present?

10,566 elutriation of fines

10,567-8 obscure / unexplained. Is this necessary? Amplify if needed.

10,587 I suggest: . . .and may systematically relate to both flow unsteadiness and flow non-uniformity. Check the veracity of the following statement; on the ground it is the other way around for experimental debris flows at USGS flume. Clearly one would anticipate high dynamic pressure associated with the 'impact' of a flow front, but this may not be the same as 'felt' by deposit on the ground. This is worth exploring. . .

10,589 similarly I'm not sure about this; is this speculation? It might, speculatively, be the other way around. You should elaborate, or reference, or both, or don't go there? I think these latter 2 sentences need careful consideration – the topic is extremely important.

10,603 use vent instead of the crater ; next line leads to another

10,613 "and have"??? Do you mean 'with forced. . .

11,705 yes, and this needs reconciling with earlier account regarding dynamic pressure and pore pressure effects (see above)

10,722 et seq hard to follow?

10,734 conferred a tilt?

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10,737 proximity to

10,738 delete first clause – unnecessary. Final sentence quite opaque / unhelpful. Help the reader here.

12,759 don't use resp., but in any case needs better elaboration / justification in main text (see above); too speculative as is.

Fig. 7 caption: syn-eruptive

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Interactive comment on Solid Earth Discuss., 6, 3261, 2014.

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