Interactive comment on “Generalization and application of the flux-conservative thermodynamic equations in the AROME model of the ALADIN system” by D. Degrauwe et al.

Anonymous Referee #2

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The study constructs a general form of the flux-conservative physics-dynamics interface described in Catry et al., 2007, and replaces the temperature-tendency based interface in AROME with this new interface.

The new interface offers an energy conserving system, and provides a more accurate model. It provides an opportunity to import new physical parameterizations into the energy conserving frame-work, and illustrates an example where the advection of sensible heat of precipitation can be of importance for the forecast.

The study highlights a topic (physics-dynamics interface) which is often overlooked. In particular in the climate community, much more attention ought to be paid on an energy conserving system, and this is a very nice contribution demonstrating how it can be applied in a general sense. It is written in a clear way, and I recommend publication upon a few minor edits.

Page 3: Line 17: heats → heat
Page 3: Line 18: heats → heat
Page 4: Line 24: heats → heat, appear in → appear on
Page 4: Line 25: these latent heats → the latent heat
Page 5: Line 5:(Piriou et al., 2007), . . . Also → (Piriou et al., 2007). Also
Page 5: Line 7: rain condensation → rain evaporation (?)
Page 5: Line 8: all kinds of transfers → all kind of transfers
Page 5: Line 11: It would be helpful to define j on this line before it is used, e.g “k=0 denotes the dry air component, and j denotes the the conversion process.”
Page 5: Line 11: heat capacities → heat capacity
Page 5: Line 15: if you define j further up, remove “in the conversion process j” from this line.
Page 8: Section 3. It would be clearer if you changed the word “current” to “previous” or something alike everywhere in this section. The first time I read through the section I thought it explained the new interface in the “current study”, which was confusing.
Page 10: Line 2: Meteorologic → Meteorological

I have opened the .pdf in two different versions of acrobate reader, but the equations are not lining up, and in some places there are symbols such as diamonds and circles, I am not sure if this is a problem on my end with an old version of adobe, or if it is something that should be addressed.