

## ***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**

Received and published: 4 February 2016

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

C1

applied in a general sense. It is written in a clear way, and I recommend publication upon a few minor edits.

Page 3: Line 14: relaxation time Bott (2008) → relaxation time, Bott (2008).

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.

C2

