Title: A mass conserving and multi-tracer efficient transport scheme in the online integrated Enviro-HIRLAM model

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General comments:

The paper describes a numerical validalition of the tridimensional (LMCSL-3D) transport scheme in the online coupled chemical-weather prediction context. The new scheme is an extension of a previous LMCSL-2D developed by one of the authors. The authors implemented LMCSL-3D in the Enviro-HIRLAM model and validated the scheme by comparing with other filters using a simple advection test-case and a complete forecast with chemistry. The authors have illustrated through numerical experiments, at least for short forecast times, that the mass conservation , locality and shape preservation proprerties of a numerical transport scheme significantly affects the chemistry. The manuscript could be reduced in length by excluding the 1D passive advection results that, in the reviewer's opinion, do not provide any new insight and were done in the author's previous articles. Another major deficiency of the manuscript is the lack of a clear mathematical statement of the LMCSL method.

I recommend that manusrispt be accepted, and recommend to the authors(if it is possible) to perform longer simulations in order to test the convergence of the method in real world of NWP/ACT forecasting.

1. Specific comments

-Replace + signs in equation (1) by - signs

-in Page 3745, First Paragraph. The comment " ...redistribution of mas from areas with small gradients to area with steeper gradients...". Please move this comment which refers to Figure 3 and Table 1 to section 4.4 after the presentation of the experiment for clarity purpose.

- in figure 6,it would be beneficial to include results from all experiments to beter characterize the impact of the various filters on chemical forecasting.

- Figure 7 timeseries show that surface ozone differences with DEPDEP from all experiments increase with time and generally converge toward the GLOBAL-PD solution. Extending the length of the forecast would be beneficial in that regard. Otherwise, authors should comment on the fact that solutions have not converged after 3 days in terms of global quantities.

- Section 5 : The auhors have to mention that LMCSL-3D refers by default to ILMC filter.

- Please retype the paper, there many typos that should be corrected.