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Interactive comment on “New fire diurnal cycle characterizations to improve fire radiative energy assessments made from low-Earth orbit satellites sampling” by N. Andela et al.

Anonymous Referee #1

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The manuscript of Andela et al. proposes a new modelling approach of the daily cycle of FRP at a hourly time scale from 4 MODIS daily observations. This development is performed to improve FRE estimates within the Global Fire Assimilation System used in the Copernicus Atmosphere Monitoring Services.

The manuscript addresses therefore an important issue, as the four or so MODIS FRP data available on a daily basis do not allow to properly sample the daily cycle of fire activity. However, the manuscript objective, as stated in the abstract “Specifically, we assess how representing the fire diurnal cycle affects FRP and FRE estimations when using data collected at MODIS overpasses” and in the introduction “The purpose of

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the work presented here is to better understand the fire diurnal cycle and its spatiotemporal dynamics, in order to develop new ways to include this into a near real time fire emissions estimation framework” are not exactly coherent between themselves.

In the same way, the manuscript title is also slightly misleading and should better reflect that actual content of the paper. A title such as “Development of a new fire diurnal cycle to improve fire radiative energy assessments derived from MODIS observations” might better reflect the work presented here.

The manuscript dives into too many details and intermediate results with a style which is probably closer to a progress report than a well focused journal paper. I would recommend to focus on the description and evaluation of the best model. It is not sure that presenting the models that have not been selected brings much to the paper clarity. With that respect, Section 3.7 is particularly confused and would require some rewriting.

Finally, the manuscript lacks accounting for uncertainties when comparing model output with SEVIRI data. I would therefore recommend estimating the uncertainties of SEVIRI dataset and accounting for these uncertainties when comparing models with observations. In the same way, the authors should question whether Pearson’s r correlation is the best statistic to be used for model evaluation of cyclic processes. It might be worthwhile to explore the potential of cross-spectral analysis in that case.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 9661, 2015.

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