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

Received and published: 26 April 2015

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
the work presented here is to better understand the fire diurnal cycle and its spatiotem-
poral 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 out-
put 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 corre-
lation 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.