

Interactive comment on “A global simulation of brown carbon: implications for photochemistry and direct radiative effect” by D. S. Jo et al.

Anonymous Referee #1

Received and published: 30 December 2015

This is very interesting and important manuscript reporting on results of global modeling of BrC impact compared with AERONET observations. The manuscript is well written and the presented modeling results are of sufficient novelty for potential publication. In addition to multiple issues already raised by two other reviewers, I would like to note that because the manuscript was likely in preparation for a long time a large volume of recent literature papers escaped authors' sight. Since BrC is a very dynamic research area, my additional requirement for the ACP publication is thorough discussion of 2014-2015 publications relevant to this study, as well as use of the most updated data as is necessary.

My specific comments are listed below:

Text of: P27807 line 23 – P27808 line 17; P27813 lines 1-30; references to include C10955

and discuss - - Moise et al, Chemical reviews 2015, 115, (10), 4400-4439; Laskin et al Chem. Rev. 2015, 115, 4335–4382

Page 27808 lines 4-5: refs to include Lin et al PCCP, 2015, DOI: 10.1039/c5cp02563j, Yu et al Atmos. Chem. Phys. 2014, 14, 13801.

Page 27808 lines 11-13: ref to include and discuss - Saleh, R. et al Nat. Geosci. 2014, 7, 647.

Page 27808 lines 15-17: refs to include - Hawkins et al Environ. Sci. Technol. 2014, 48, 2273.; Flores et al. Phys. Chem. Chem. Phys. 2014, 16, 10629.; Liu et al. Geophys. Res. Lett. 2014, 41, 2191.; Laskin et al Environ. Sci. Technol. 2014, 48, 12047.

Text of: P27808 line 18 – P27809 line 11 references to include and discuss - Wang et al Atmos. Chem. Phys., 2014, 14, 10989.; Lin et al J. Geophys. Res.: Atmos. 2014, 119, 7453.

Page 27809 line 3, and through the text: Use of unpublished work of McMeeking from (2008..!?) is not appropriate by my opinion. Instead, application of recent parameterizations from Liu et al, Geophys. Res. Lett., 41, 742–748, doi:10.1002/2013GL058392 will be more suitable.

Page 27809 lines 5-6: ref to include - Lin et al PCCP, 2015, DOI: 10.1039/c5cp02563j

Page 27809 lines 23: ref to include - Chakrabarty et al, Environ. Sci. Technol. Lett. 2014, 1, 44.

Section 7 – Effect on Ozone photochemistry: Ref to include and discuss - Jiang et al. Environ. Sci. Technol. 2012, 46, 11878.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 27805, 2015.