Review of "Contributions of residential 1 coal combustion to the air quality in Beijing-Tianjin-Hebei (BTH), China: A case study" by Xia et al.

General comments

The authors present a WRF-CHEM modeling study on quantifying the impacts of residential coal combustion (RCC) emissions on air quality in the BTH region. This study is done under the background that the BTH region has been plagued with persistent heavy haze pollution, coal combustion is a major pollutant emission source in this region, and there has been a debate on the roles of local emissions and regional transport in the haze pollution in Beijing. They conclude that although local RCC emissions make an important contribution to the haze pollution in Beijing, it is necessary to control the RCC emissions in the entire BTH and its surrounding areas in order to significantly reduce the haze levels in Beijing. The manuscript is well organized and presented, and the methodology is sound. It can be published with minor revisions.

Specific comments

1. According to the information in the Introduction (L81-91), there have been several model studies regarding the impacts of the emissions of coal combustion and/or RCC on air quality in the BTH. What are new in this study compared to these studies? Are the results of this study consistent with other studies, and if not, why?

2. When discussing the modeling discrepancy, the authors emphasize the bias from simulated meteorology. Emissions as another likely factor should also be addressed. The effect of the meteorology uncertainty should affect all pollutants, especially primary pollutants, not just PM2.5. As such, the authors should also examine if the earlier fall-off and underestimation occur to other pollutants (especially primary pollutants, such as CO and SO2); if it does, it provides additional evidence for the factor of meteorology; if not, other factors need to be taken into account.

3. L225, it would be helpful to provide the numbers by Huang et al (2014).

4. L268, I suggest to change the section title to something like "Contribution of local RCC emissions to air quality in Beijing" to differentiate section 3.3 and the case of "SEN-BTH".

5. L280-282, deliberate the "controversial issue".

L309, 25% contribution by local RCC does not warrant the RCC to be the MAIN cause.

L311 -312 and L336-337, you use the number of RCC contributing 15-20% to PM2.5 during moderate to severe pollution conditions to argue the importance of regional transport to the haze pollution in Beijing. There is a flaw in the argument, since there might be local anthropogenic emissions other than RCC that could make significant contributions too. To argue the importance of the regional transport, you better to contrast the results in the cases of BTH-SEN

and SEN-PEK (30% vs 18%, i.e., 12% from the RCC emission transport vs 18% from local RCC) to conclude.

Technique issues

1. The language needs to be polished. Following are some examples

The use of "vice versa" in L206 and L225 is not correct. You mean "opposite"?
The use of "dispersion" in L186 and L199 is not appropriate either; you mean bias or disparity?
Delete "well" in L154, 173, 176, 184, 192 and 343;
In L21, 174, 177, L193, and L318, , change "compared with" or "compared to" to "when compared with" or "against".

2. Delete the first name initials in L81-88