

Interactive comment on “Effect of explicit urban land surface representation on the simulation of the 26 July 2005 heavy rain event over Mumbai, India” by M. Lei et al.

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General: This paper seems to be fine for this Journal in term of quality and science. Paper titles " Effect of explicit urban land surface representation on the simulation of the 26 July 2005 heavy rain event over Mumbai, India" has shown basically the RAMS performance and urban effect on heavy rain case. With Urban model included in RAMS substantial improve rainfall amount due to urban effect on air motion aver the Mumbai, which can effectively change the cloud and rain. The effect of UHI are encouraging in this study and I appreciate this work. But this paper need to address few more thing in open discussion.

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General open question : 1. As mentioned on Page 8778 (ln 5) RAMS model skill to simulate convective system, Is RAMS able to simulated convective cell, If yes then please justify the role of UHI on stron convective cells.

2. Level at which, westerly become easterly called as critical level. My question is how this critical level get affected during starting time of rain to ending time of rain. Is there any significant change on this critical level while heavy rain time?.

3. Page 8787 (ln: 1-5) - With TEB experiment, rainfall increased by 150-200 mm, can author explain and show how it affected mesoscale circulation of 850 hPa level and 500 hPa (for eg: geostrophic flow). I just want to understand the TEB effect of mesoscale circulation at this two levels if it changes rainfall intensity by 200 mm.

Minor Comments and discussion: 1. Page 8774 (ln:21) - Realistic gradient in what parameters that are important in relation to convergence zone.

2. Page 8775 (ln: 24-25) - Vaidya and Kulakrni (2006) found cloud burst phenomenon was the main reason for the heavy rain or they just assumed that this heavy rain may occur due to cloud burst. Please correct statement.

3. Page 8778 (ln:7-9) - Nested RAMS model domain are choosen by author as 80,20,5 km with time step 27,9,3 sec. My question is time step is 9:3:1 ratio order, which is not consistent with grid ratio. Are this kind of model configuration affect result?.

4. Page 8779 (ln:7) - SST figure shows larger gradient over west coast prior to heavy rain. Is it unusual sst variation during this time and year, what past studies indicate?. Is there any reference which shows large sst gradient in this month?.

5. Page 8780 (ln: 15) Please provide reference of offshore trough over Arabian Sea. Just give refence which can establish the mechanism and evolution of this offshore.

6. Page 8781 (ln: 1-2) NCEP analysis or NCEP reanalysis. Please correct. Secondly, NCEP analysis is repeated in text.

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7. Page 8782 (ln: 16) - not feasible to use hotspot word.
8. Page 8782 (ln: 16) - Figure 6c should be in mm units.
9. Page 8782 (ln: 24) - Can we called this event as "Storm" during Monsoon period.
10. Page 8782 (ln: 26)- "0Z" corrected to 00Z.
11. Page 8783 (ln: 16) - If author provide some bias and rmse statics then it helps to determine urban effect more efficiently.
12. page 8784 (ln:15) - In fig 8e over seas surface, 1000 hPa air temperature shown high variation. Justify?
13. Page 8785 (ln: 25) - Where is Fig (12c)?.
14. Page 8786 (ln: 4-5) - Where is Fig 13c and 13d?.
15. Page 8786 (ln: 25) - In fig 15, where is fig 15c and Is fig 15b missing?.
16. Page 8789 (conclusion 4.) Where this moisture came from. Is from RAMS we can understand the moisture source as it run on high resolution we can determine the moisture source.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 8773, 2008.

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