

## ***Interactive comment on “Comparison of the Arctic upper-air temperatures from radiosonde and radio occultation observations” by Liang Chang et al.***

**Liang Chang et al.**

chlbwinds@hotmail.com

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The authors make great efforts to compare the arctic upper-air temperature from the radiosonde and cosmic RO wetPrf data. Some results have been shown. But many similar works have been published. So I think the authors should add some novel study in this Paper. Answer: Thanks very much for your encouragements on our manuscript. We admit that many works about comparing the temperature measurements between radiosonde (RS) and COSMIC observations have been done. However, the abilities of COSMIC observation on revealing the Arctic climate change may need to be further investigated. Despite the incapability of radio occultation (RO) observations on estimating the surface atmospheric temperature has been demonstrated from previous studies, we found in the manuscript that the RO derived seasonal temperature anomalies at  $5 \times 5$  degree grids from 2007 to 2012 at 400 hPa

show the best agreement with RS results, with a RMS and mean difference of 0.19 and 0.07 °C, respectively. Furthermore, analysis of seasonal temperature anomalies from  $5 \times 5$  degree gridded COSMIC observations at 400 hPa during the Arctic sea ice minimum (SIM) of 2007 and 2012 shows that the RO observations could be helpful to reveal the Arctic sea ice decline in 2007 and 2012 on atmospheric thermodynamics. However, the spatially scattered RS observations over the land fail to depict the details of Arctic temperature variations and therefore the Arctic sea ice change. As such, it can be found in the manuscript that the wider coverage of COSMIC observations showed advantages of revealing the temperature variations over both land and ocean areas, which could be helpful to understand more details about Arctic climate change.

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/amt-2016-232/amt-2016-232-AC2-supplement.zip>

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Discussion paper

