Atmos. Meas. Tech. Discuss., 8, C4440–C4443, 2015
www.atmos-meas-tech-discuss.net/8/C4440/2015/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Real time data acquisition of commercial microwave link networks for hydrometeorological applications" *by* C. Chwala et al.

Anonymous Referee #2

Received and published: 21 December 2015

GENERAL COMMENTS

The manuscript presents open source data acquisition system designed by authors to retrieve weather data from networks of cellular commercial microwave links (CMLs). The manuscript is well structured, clearly explains motivation for developing such a tool (retrieving CML rain rate data with high temporal resolution) and also describes the main principles of CML polling, i.e. the basis of the application. It also presents a successful test of the application on a real cellular network in operational conditions. The reviewer appreciate very much that authors publish their code under open source license and provide it through a standard repository (gitHub).

The authors state that their data acquisition system is first of its kind; however similar system was already used for CML data acquisition by Fencl et al., (2015), although their software was not an open source. The novelty of the manuscript lays therefore rather than in presenting data acquisition system itself, in showing transferability and scalability of such a tool.

The reviewer recommends to accept the manuscript after revisions specified bellow. The reviewer recommends especially, to present more in detail the performance of authors' system in terms of its effect on a CML network (data traffic), and also in terms of a computational demands on a server side. Authors might show the performance statistics from real operation of their system and the expected performance statistics for larger networks or higher temporal resolutions (authors mention they have done such calculations). This would be also in agreement with one of the authors' goals, to encourage operators to open their networks. Data traffic issues and security of a whole system, in terms of not hindering the primary function of a CML network, will be most probably operators' main concern.

SPECIFIC COMMENTS

12246, 15: The authors state that CML networks provide good coverage also in inhabited areas and refer to Overeem et al. (2013). Overeem et al. however state that CML coverage coincides (in global scale) with population density. Their country wide CML rainfall maps were reconstructed for Netherlands where there are rarely any larger inhabited areas. Please change the reference or the statement itself.

12247, 24: Isn't one of the limitations of the approach also variations in TX-level due to hardware issues (although it is assumed to be constant)?

12249,19 and 12251, 1-8): To reviewers understanding the simultaneous SNMP requests are enabled by defining data acquisition process for each single CML. Does the approach, when each single CML is handled by its own process, restrict number of CMLs, which can be queried simultaneously? Country-wide CML networks might

have one or two orders of magnitude more CMLs than amount, on which the application was tested (450). Could you comment on i) an ability of the pySNMPdaq to query thousands of CMLs without time synchronization problems ii) if CML networks can smoothly handle data traffic when thousands of SNMP requests are sent simultaneously?

12252, 6-8: What kind of interference of pySNMPdaq with CML's normal operation can occur? Is there direct risk endangering flow of telecommunication data, or rather the risk of hindering smooth CML network management? To reviewer's knowledge there is a special reserved service channel for CML network management. Does pySNMPdaq use this channel to acquire TX/RX-level data?

12252, 21-12253, 11 and 12253, 22-27: Although presented data examples are interesting, they do not have straight connection to the data application system itself. The reviewer suggests to link these examples to the system e.g. by commenting on the gain of obtaining CML data with a 1 s and 1 min resolution in contrast to the computational or data traffic expense of such resolutions.

12253, 9-11: Can the channels of single CML interfere with each other and cause these small variations?

12254, 9-13: There are additional calculations of data traffic mentioned in this paragraph, without further specification. The traffic issue is, however, main constraint possibly limiting number of CMLs, which can be polled from one server. Additional data traffic might impair CML network operation. Thus, traffic issues will be for cellular operators (and other CML owners) of the main interests when opening their network for such data acquisition system. The reviewer therefore suggests to specify data traffic calculations more in detail, show specific results and comment on them (e.g. in section 6).

12254, 17-18: Special designed application for weather data acquisition was also used by Fencl et al., (2015). Their application was used in operational conditions and pro-

vided data with temporal resolution approx. 12 s (Fencl et al., 2015).

REFERENCES

Fencl, M., Rieckermann, J., SÃ¡kora, P., StránskÃ¡, D. and Bareš, V.: Commercial microwave links instead of rain gauges: fiction or reality?, Water Sci. Technol., 71(1), 31, doi:10.2166/wst.2014.466, 2015.

Overeem, A., Leijnse, H. and Uijlenhoet, R.: Country-wide rainfall maps from cellular communication networks, Proc. Natl. Acad. Sci., 110(8), 2741–2745, doi:10.1073/pnas.1217961110, 2013.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 12243, 2015.