

Measuring rainfall in urban areas using commercial cellular telephone networks

Aart Overeem, Hidde Leijnse, Remko Uijlenhoet



Hydrology and Quantitative Water Management Group
Wageningen University, the Netherlands
Royal Netherlands Meteorological Institute (KNMI)

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Outline



- ▶ Methodology
- ▶ Weather radar and commercial microwave link data
- ▶ Verification of link-based rainfall intensities
- ▶ Conclusions



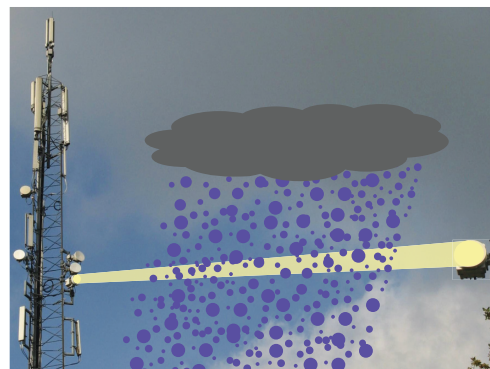
Methodology



Commercial cellular telephone network from one provider



Methodology



Messer *et al.* (2006), Leijnse *et al.* (2007)

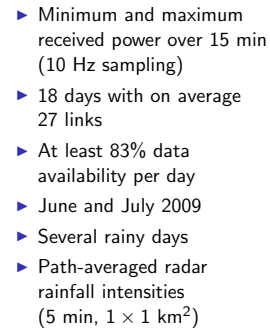




$$\bar{R} = a(1 + 0.5b(b-1)CV_k^2) \bar{k}^b$$

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- ▶ Select a single link and all nearby links within 10 km
- ▶ A 15-min period is considered wet if several links have low minimum received powers.
- ▶ Repeat these steps for all other links and every 15-min period

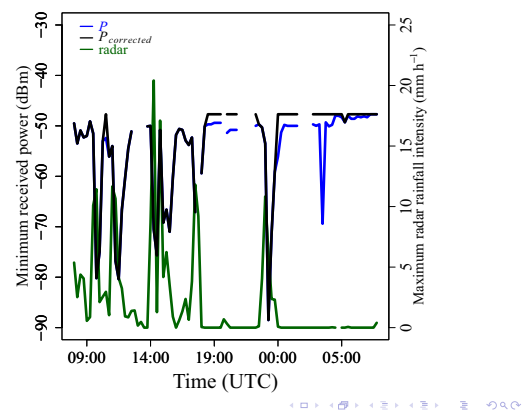


Verification of link-based rainfall intensities

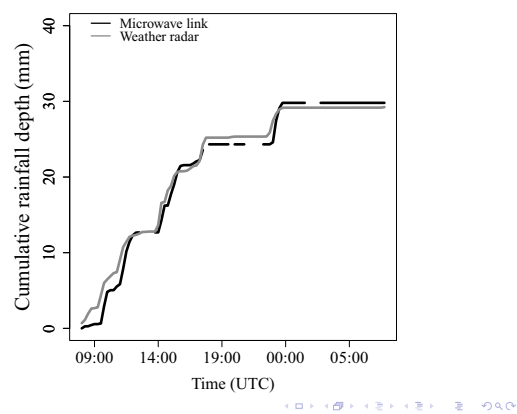


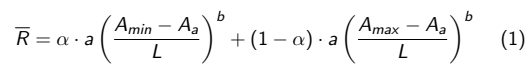


Verification of link-based rainfall intensities



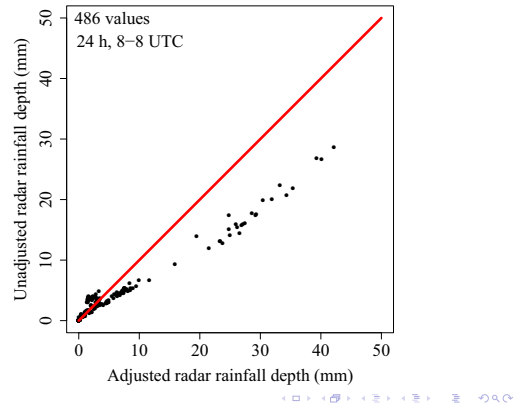
Verification of link-based rainfall intensities



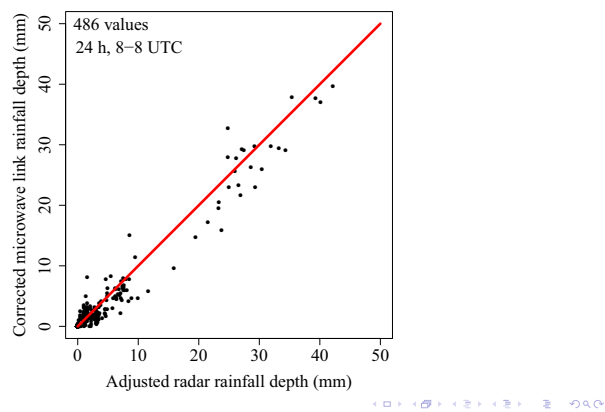




Verification of link-based rainfall intensities

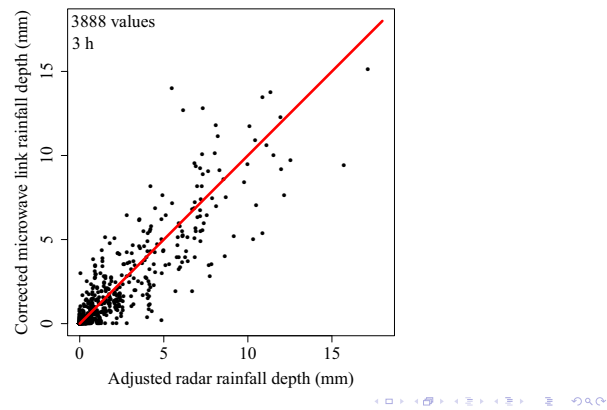


Verification of link-based rainfall intensities

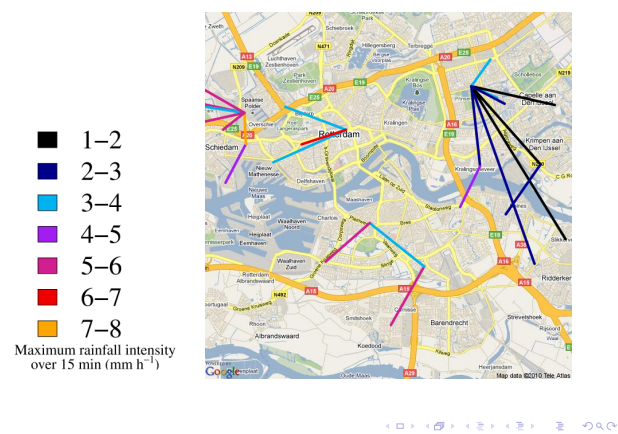


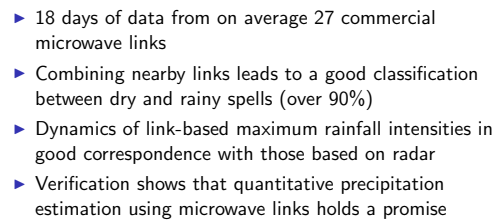


Verification of link-based rainfall intensities



Verification of link-based rainfall intensities





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