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Atmospheric Research 77 (2005) 300–312

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ATMOSPHERIC  
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# Microwave links: The future for urban rainfall measurement?

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Received 29 March 2004; received in revised form 30 August 2004; accepted 15 October 2004

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## Abstract

Microwave links are ideally suited to the urban environment, since there are many suitable vandal-free locations to which the receiver and transmitter can be attached. A signal sent along a link is received with reduced power as a consequence of scattering and absorption by intervening water droplets. Thus a measurement of the power loss can be transformed into a measure of total path rainfall. This paper discusses the requirements for the estimation process to be accurate. The paper presents results using a single frequency, together with the improved results from a dual-frequency link. Potential future applications of microwave links are presented.

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*Keywords:* Microwave links; Radar; Rainfall; Raingauge

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## 1. Introduction

We commence with a brief discussion of the problems experienced by raingauges and radars. We then introduce the microwave link, explaining how it is able to provide

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information about rainfall. We describe the results of our recent experiments in the Bolton region of North-West England with purpose-built dual-frequency links, and demonstrate how these results are improved by the use of raingauge or radar data. We conclude by outlining proposed further experimental work, including the possibility of using links for near real-time calibration of radar data.

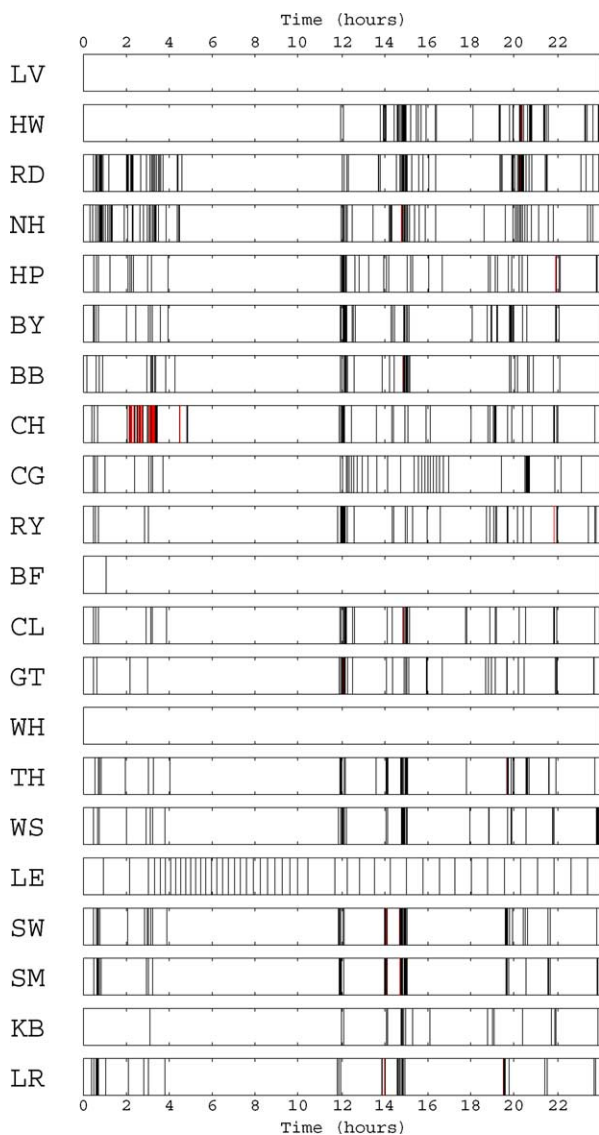


Fig. 1. Records of 21 raingauges in a region 10 km by 12 km, near Bolton: four gauges give false reports. Gauges LE and CG are partially blocked, with different, but characteristic tipping patterns. Gauge BF is almost completely blocked. Gauge KB was poorly sited, and was sheltered from the storm during the morning.

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