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Rainfall maps from commercial microwave links (CMLs) and urban flood prediction : Pilot tests of an early warning system in several African cities

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The african monsoon season from May to October brings heavy rainfalls, which can lead to catastrophic flooding events. For example, 1st September 2009 a Mesoscale Convective System over the city of Ouagadougou (300mm of rain in 12h) left over 200 000 disaster victims. Many African cities are suffering similar problems and are looking forward for innovative and cost effective solutions to monitor these hydro-meteorological events.
Our team already demonstrated that Commercial Microwave links (CML) could be a good solution for rain observation in countries with sparse gauges network, poor access to real time information and heavy convective rainfall, as in West Africa. Many studies in Europe and Israel had previously presented the principles of CMLs based rainfall estimation, based on the attenuation of microwave signal by rain droplets, from which rainfall intensities between antennas can be derived. Previous studies have also discussed the uncertainties in CML derived rainfall estimation and rain maps.
Here we will present some new results in West and Central Africa, where rainfall maps could be derived at urban scale from (relatively) dense network of CMLs. Several method for the estimation of rainfall on each CML and for the interpolation of the data to obtain maps will be compared. The quantitative evaluation of the rain maps quality will be discussed and we will also present the framework of our studies : a world bank/GFDRR project to demonstrate the feasibility of CMLs based information for operational flood forecast and risk monitoring in developing countries.