

## **RainGain** – Radar for high resolution urban rainfall **estimation and flood prediction** Marie-claire ten Veldhuis<sup>1</sup> Čedo Maksimović<sup>2</sup>, Daniel Schertzer<sup>3</sup>, Patrick Willems<sup>4</sup>

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## Extreme rainfall and flooding in the city





Oranjepolder: 490 ha

Urban areas: high imperviousness, high spatial variability  $\rightarrow$  required data resolution << 1 km in space; < 5 min in time

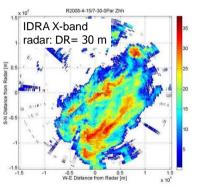
Prinsenbeek: 100 ha



Urban flood modelling: high resolution versus short calculation times: Hybrid 1D/1D + 1D/2D simulation

Water Management Department Faculty of Civil Engineering and Geosciences Delft University of Technology

The RAINGAIN project aims to analyse the applicability of new weather radars technology in the context of urban hydrological modelling. C-band and X-band radars and a network of rain gauges will be implemented in four highly urbanised catchments in NW Europe to analyse their capability to accurately estimate and predict urban rainfall at high resolution (<5 min; <100mx100m).



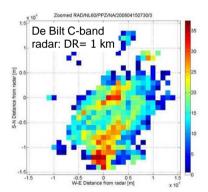


Illustration of high resolution reflectivity image for polarimetric X-band radar (IDRA Cabauw) Courtesy: KNMI

## **Research challenges:**

- Integration of Cband-Xband-radar data and rain gauge data
  - High resolution radar-rainfall estimation in urban environment (clutter, local variability)
- Rainfall forecast at high resolution for urban areas
- Flood modelling and prediction at street scale and lead time>hour
- Trade-off modelling accuracy versus calculation time
- Implementation of high resolution rainfall and flood data in operational water control

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DWE INTERREG IN

TUDelft

RainGain: 13 partners:	Dent
Xband/Improved Cband radars in 4 Pilots:	Revelacia Holland
4 PIIOLS:	ZUID
Rotterdam (NL)	Gemeente Rotterdam
Leuven (BE)	
Paris (FR)	e e
London (UK)	Aquafin
	École des Ponts Parie/Tech
	VAL de MARNE Constitueed
W/D1. Installation and tasting of radam	seine saint denis
WP1: Installation and testing of radars Lead: ParisTech (D. Schertzer) WP2: Fine-scale rainfall estimation and forecasting	METEO FRANCE
Lead: KU Leuven (P. Willems)	Imperial College London
WP3: Urban flood modelling and prediction Lead: Imperial College of London (C. Maksimovic)	See Met Office
WP4: Implementation of fine-scale rainfall estimation and flood modelling in urban water management	Flood Forum
practice. Lead: TU Delft (M. ten Veldhuis)	<b>VEOLIA</b> ENVEOLIA

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Delft University of Technology