



AUN2014 : Airports in Urban Networks
15-16 Apr 2014 CNIT - Paris la Défense (France)



Modelling of water flow and prediction of water depth on runways

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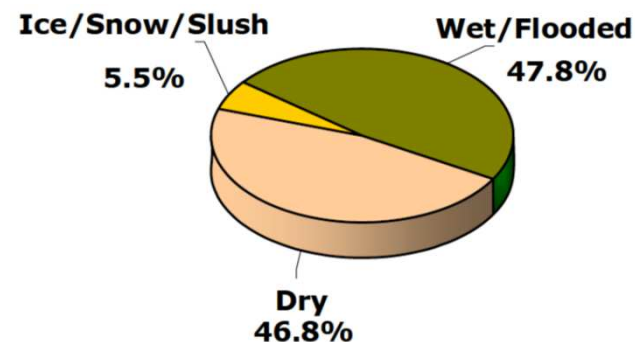
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Context



- Aircraft performances during take-off and landing depend on runway surface conditions
→ Surfaces with contaminants = higher braking distances
- Risk of accident: x10 on wet surfaces
- Difficulties to define and measure waterdepth





The need...



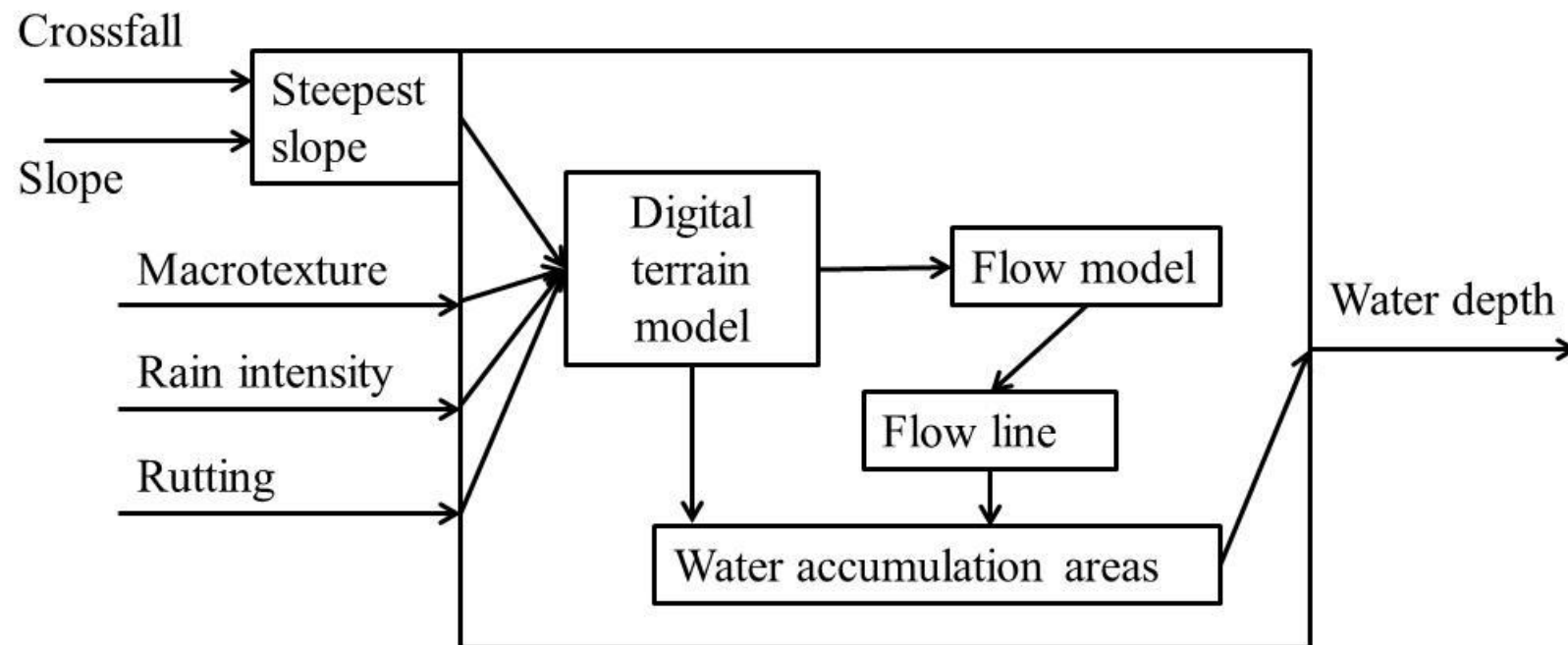
- A Tool:
 - To estimate continuously waterdepth on runways
 - To predict the evolution of the state of the pavement surface
- ➔ Inform pilots about available skid resistance
- ➔ Allow or not take-off and landing





Principle

- Diagnosis → water accumulation areas
- Waterdepth modeling → $f(\text{MPD}, I, L, p)$

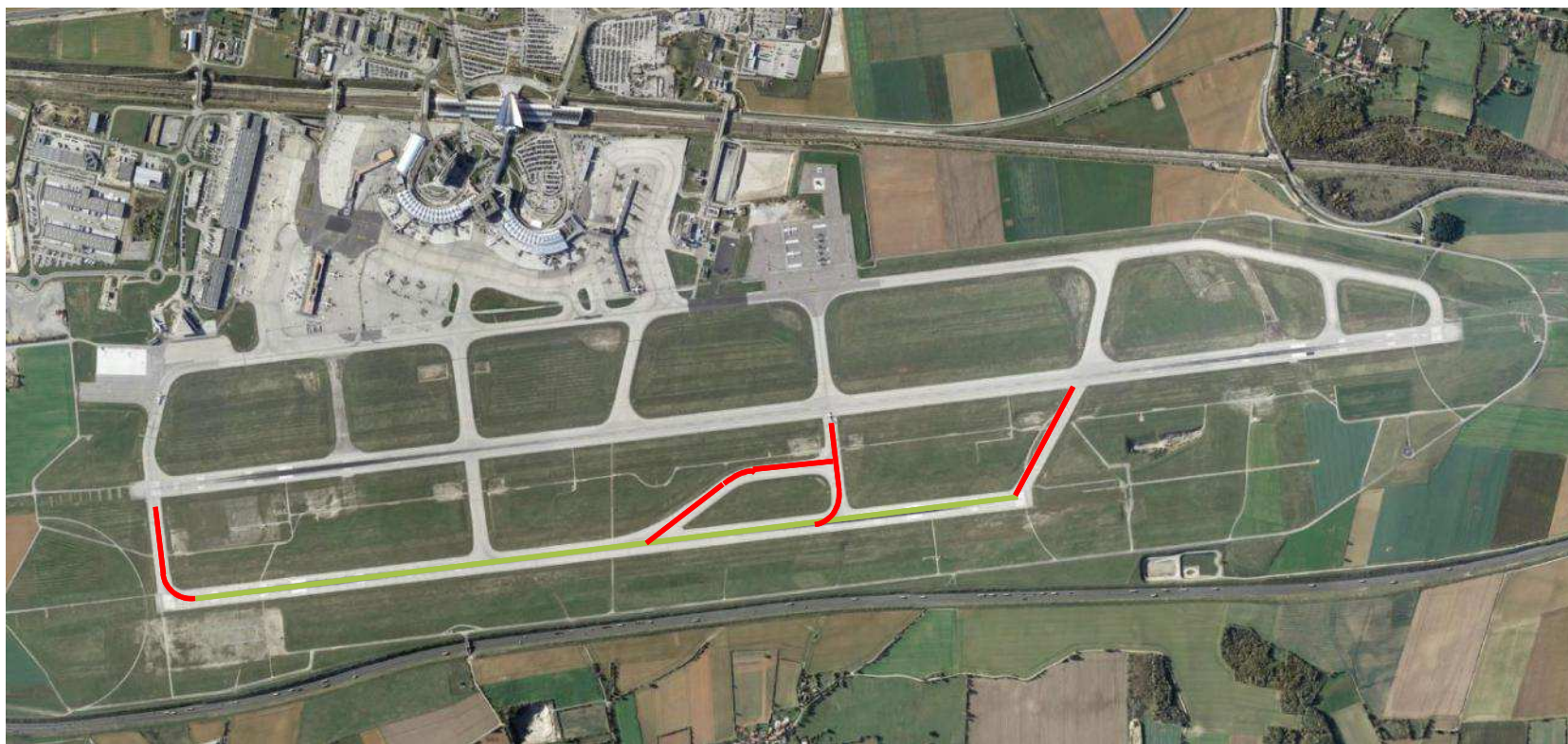




Experimentations



- Airport Saint-Exupery (Lyon, France)

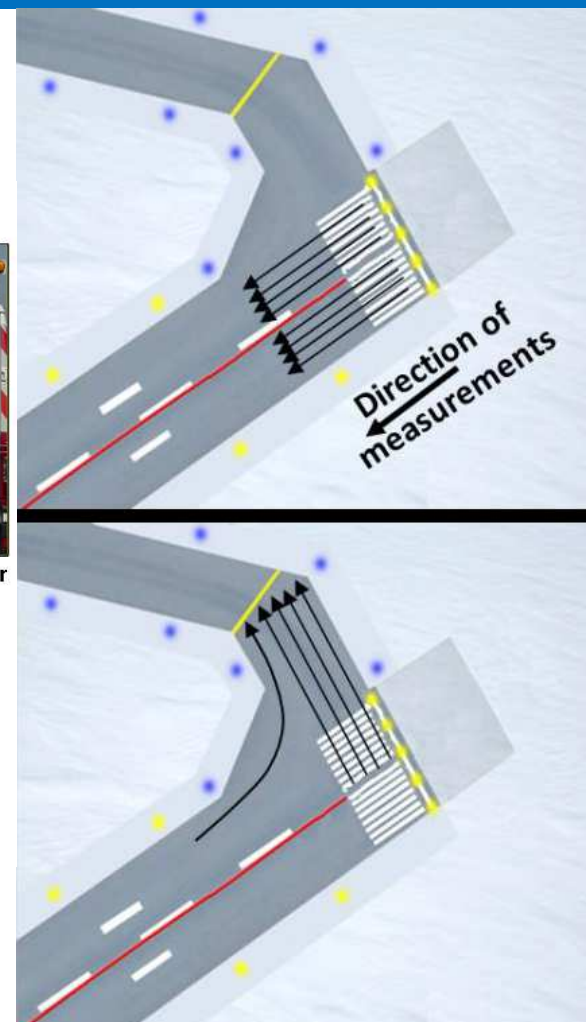
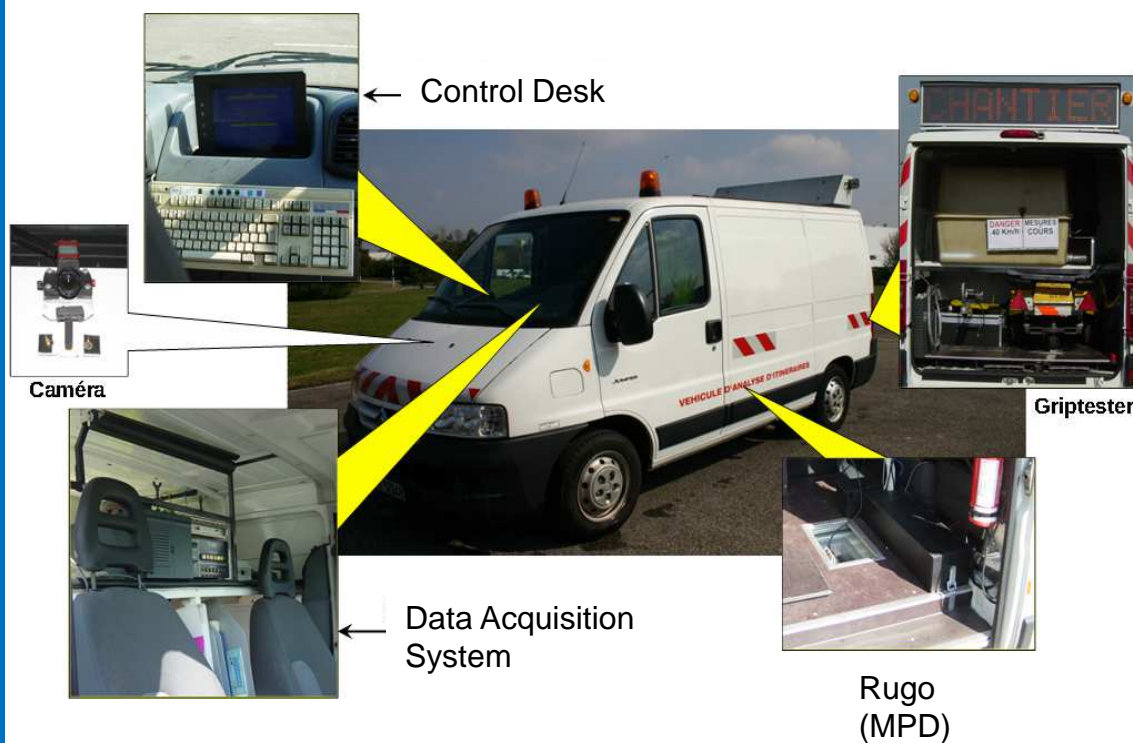




Characterization



■ Runway and 4 taxiways



➔ Cartography



Waterdepth measurements



- Sensor DSC111 (Vaisala):
 - 0 – 2 mm (± 0.01 mm) and 7% of error above 2 mm

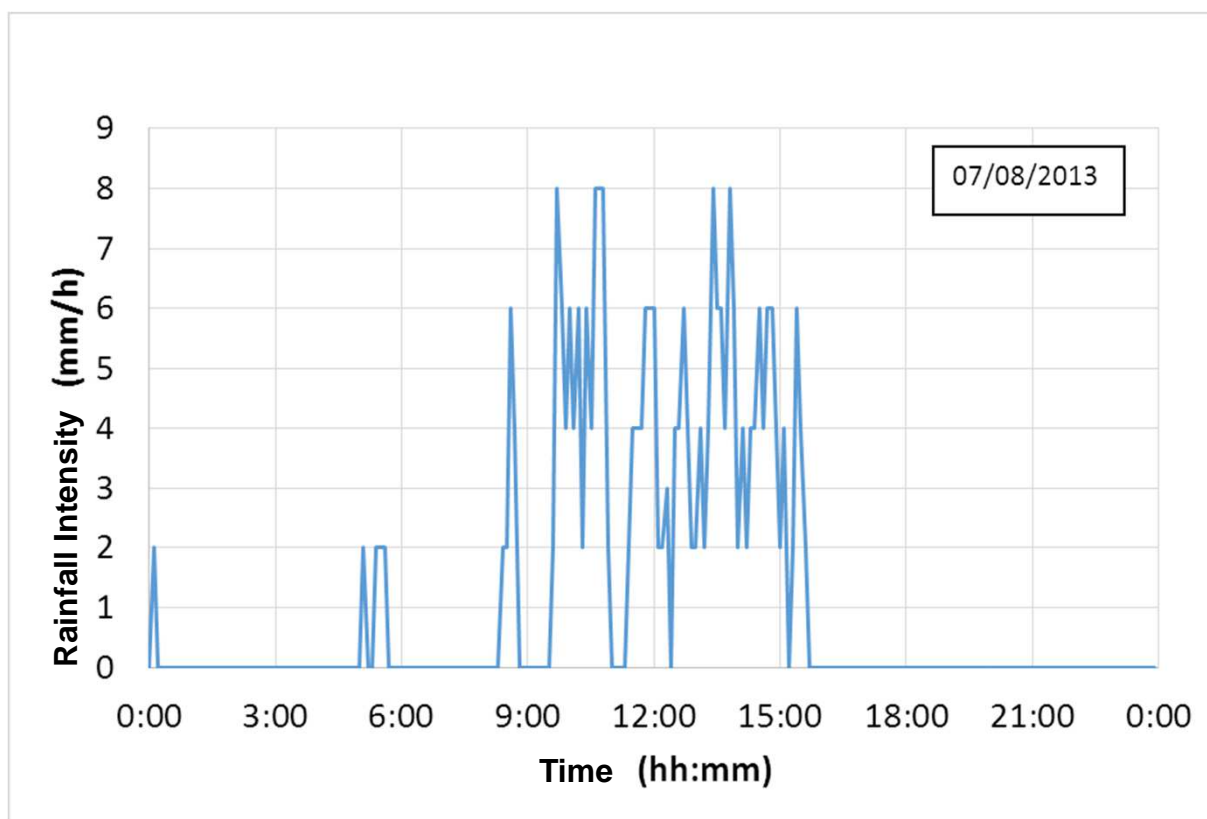




Meteorological data

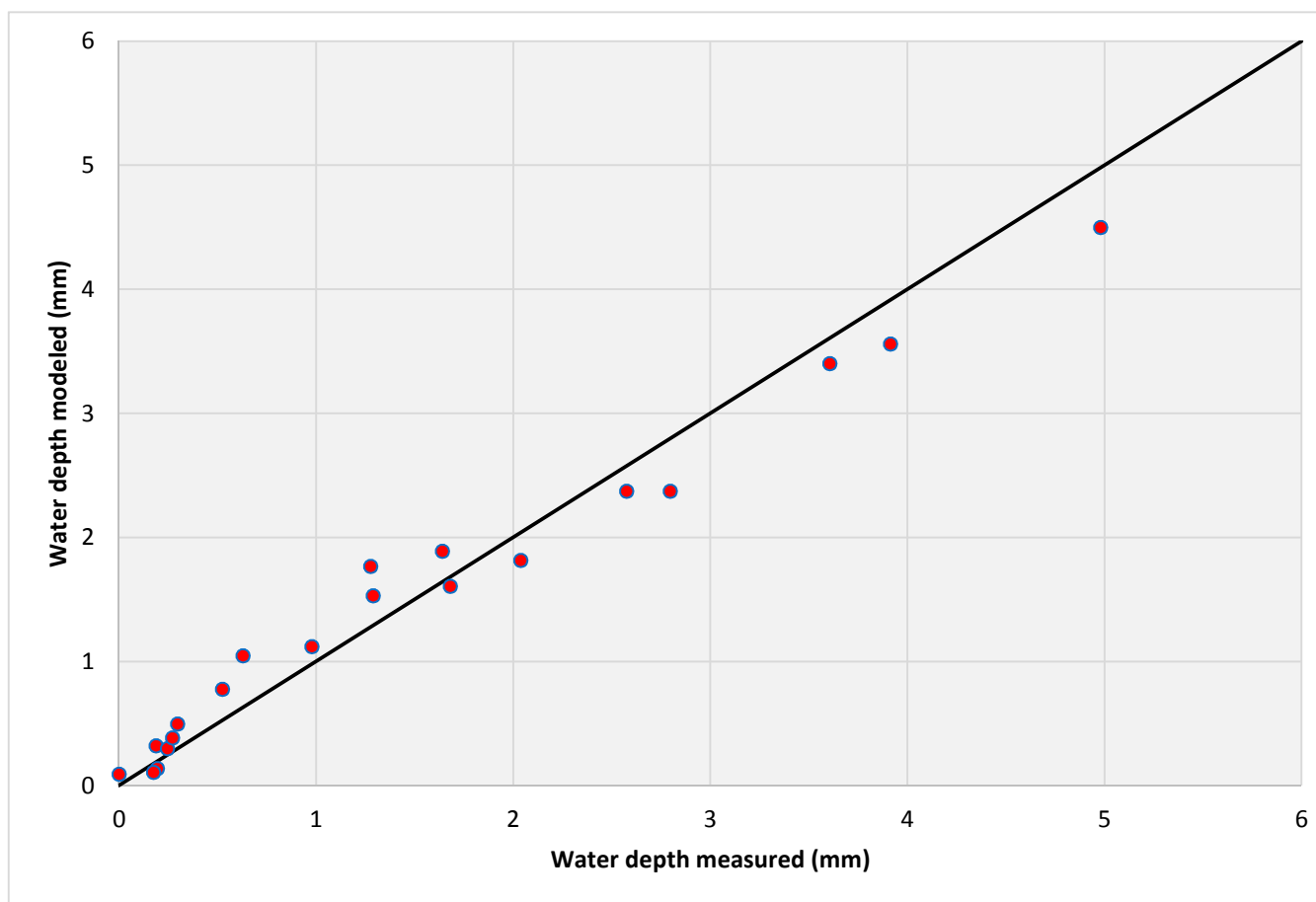


- Weather station – data recorded every 6 mn





Results - waterdepth





Conclusion



- Method of diagnosis on runway easy to implement
 - Detection of Water accumulation areas
 - Estimation of waterdepth (8 to 19% of error)
- Next steps
 - Complete experimentation
 - Include drying model
 - Include effect of wind...



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Thank you for attention...

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