



Anemometer Evaluation with Novel Performance Index

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Plan

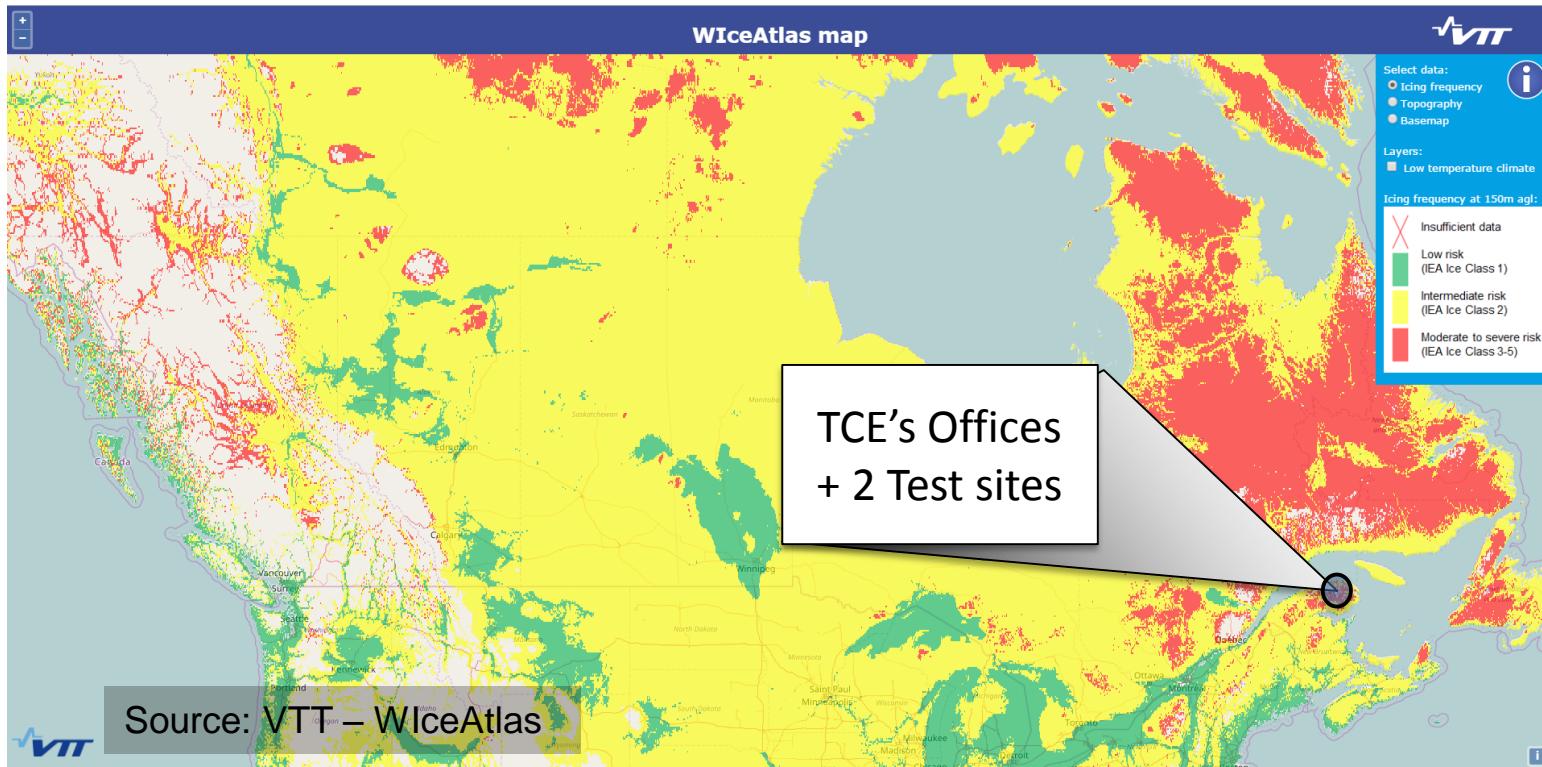
1. Who is Wind Energy TechnoCentre (TCE)?
2. How and why do we evaluate anemometer in Cold Climate(CC)?
3. Test sites and anemometers
4. TCE's performance index
5. Overall results
6. What's next?

Who is Wind Energy Technocentre (TCE)?

Non-profit organization

Applied R&D

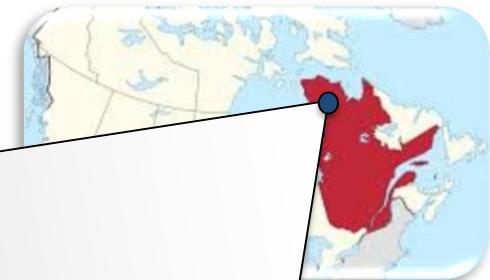
Technical assistance



- **Wind Energy in cold climate**
- Complex terrain analysis

- Micro-grid optimization
- Operation & Maintenance

Who are TCE's clients?

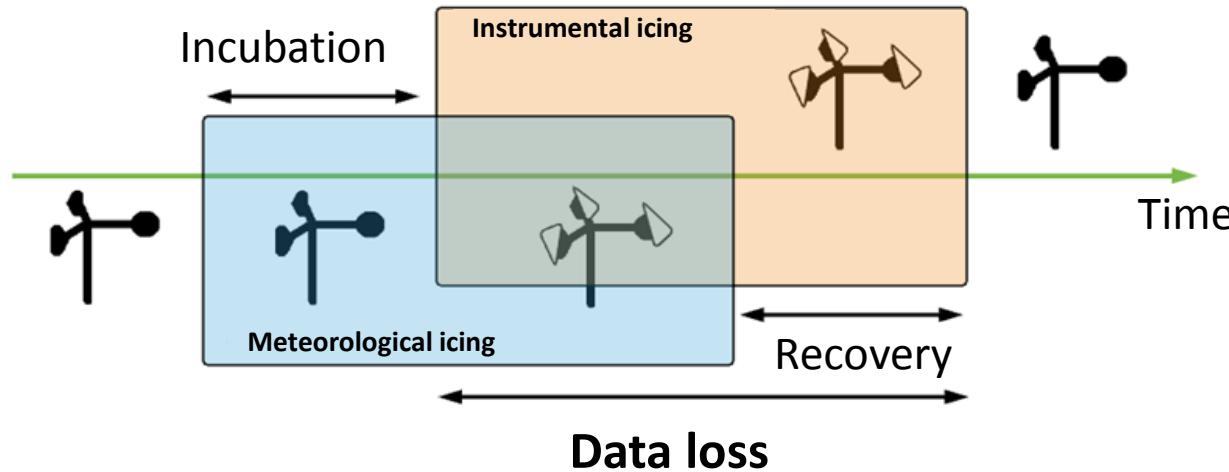


Raglan Mine project



How do we evaluate anemometers in CC?

2007: COST 727

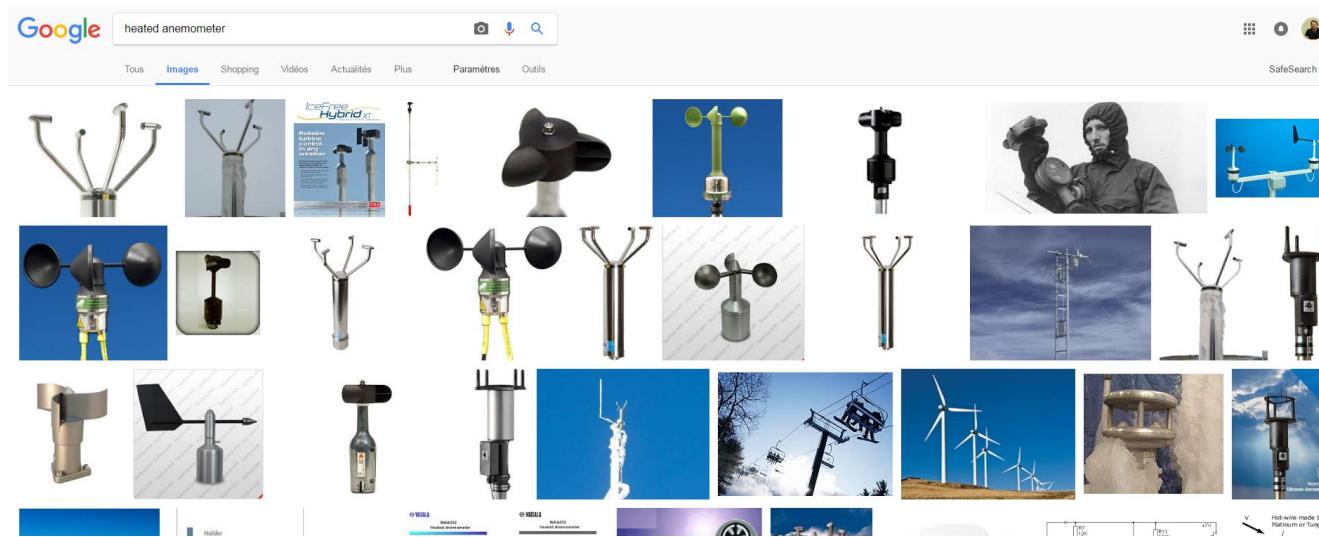


$$PI_{COST\ 727} = \frac{t_{instr}}{t_{meteo}}$$

**Site Icing Index
(Severity)**

Why evaluating anemometers in CC?

2017: Google



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700\$ → 15000\$



20W → 310W

Test sites and anemometers

Rivière-au-Renard: 325m
~ 700 hrs/years



Murdochville: 900m
~ 1200 hrs/years



 **VAISALA**

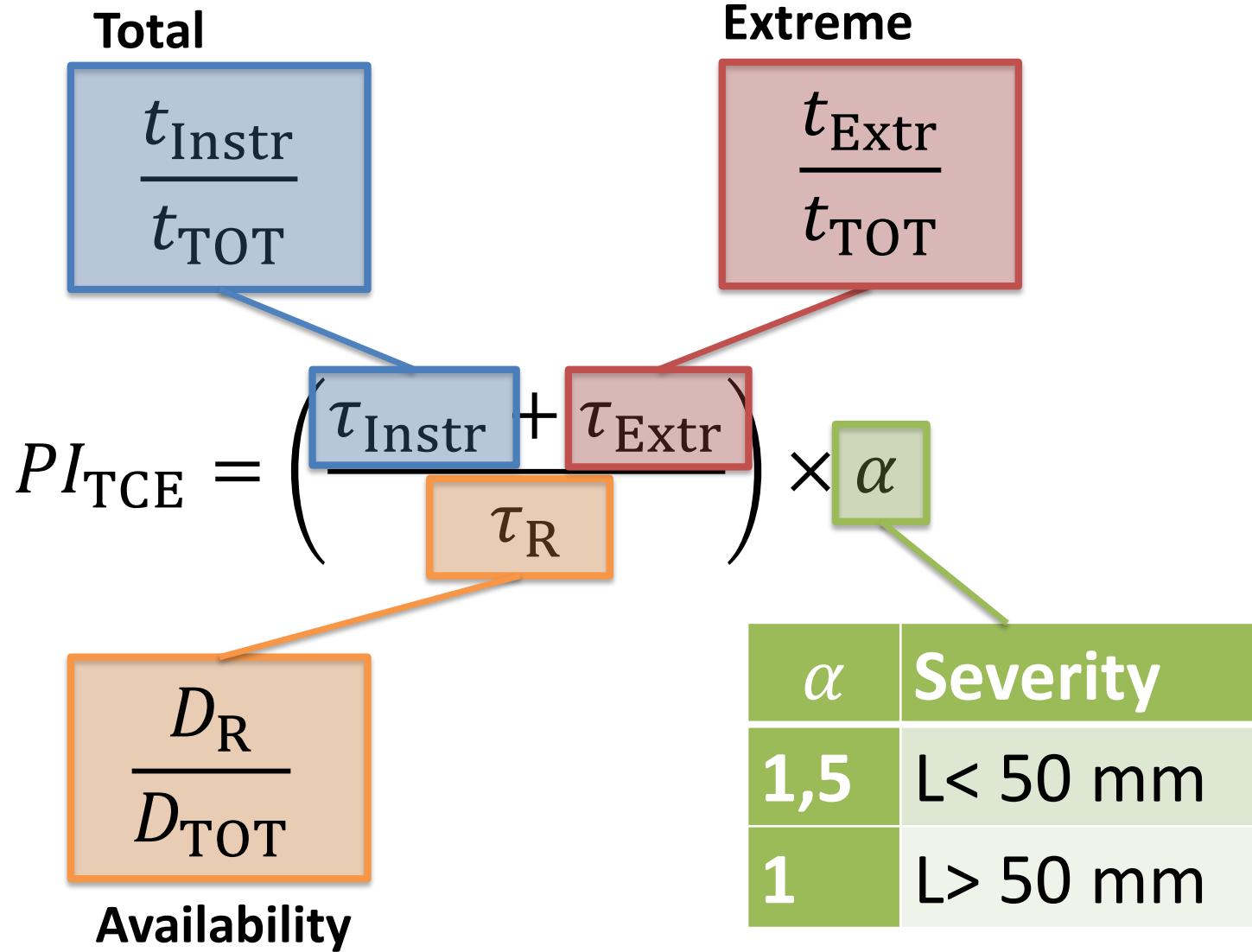
Thies
CLIMA

NRG
SYSTEMS


Lufft
a passion for precision

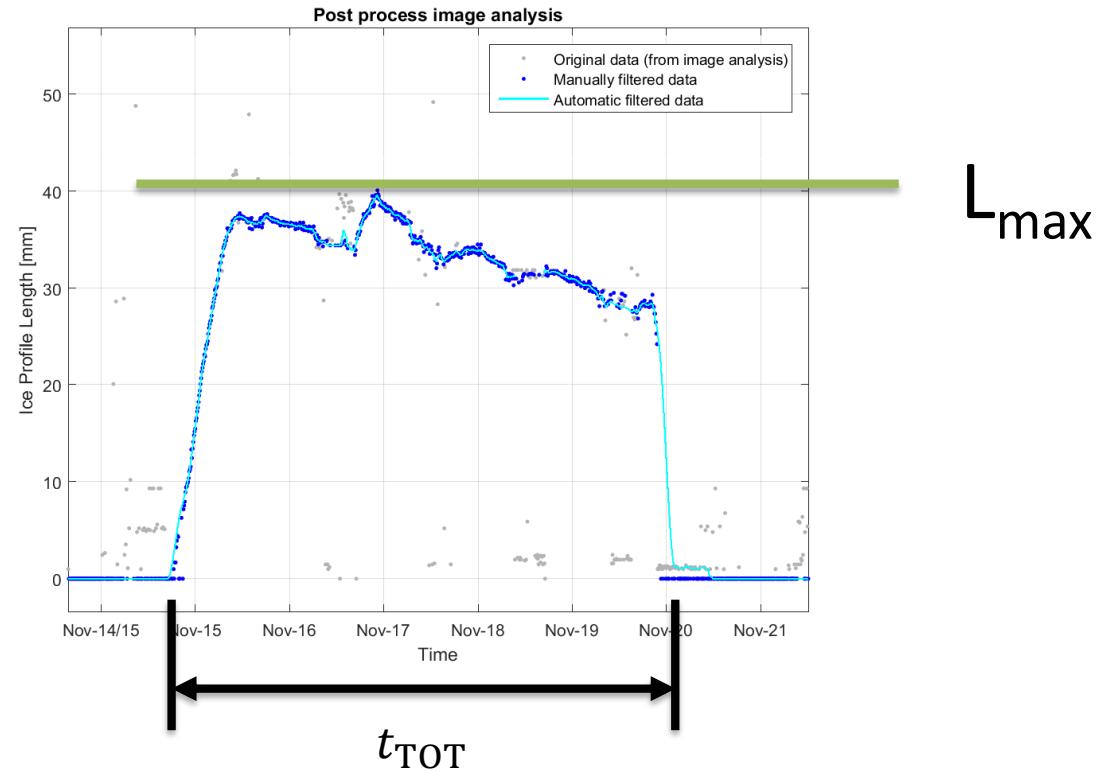
METEK
Meteorologische Messtechnik GmbH
Germany

TCE's Performance Index



TCE's Performance Index

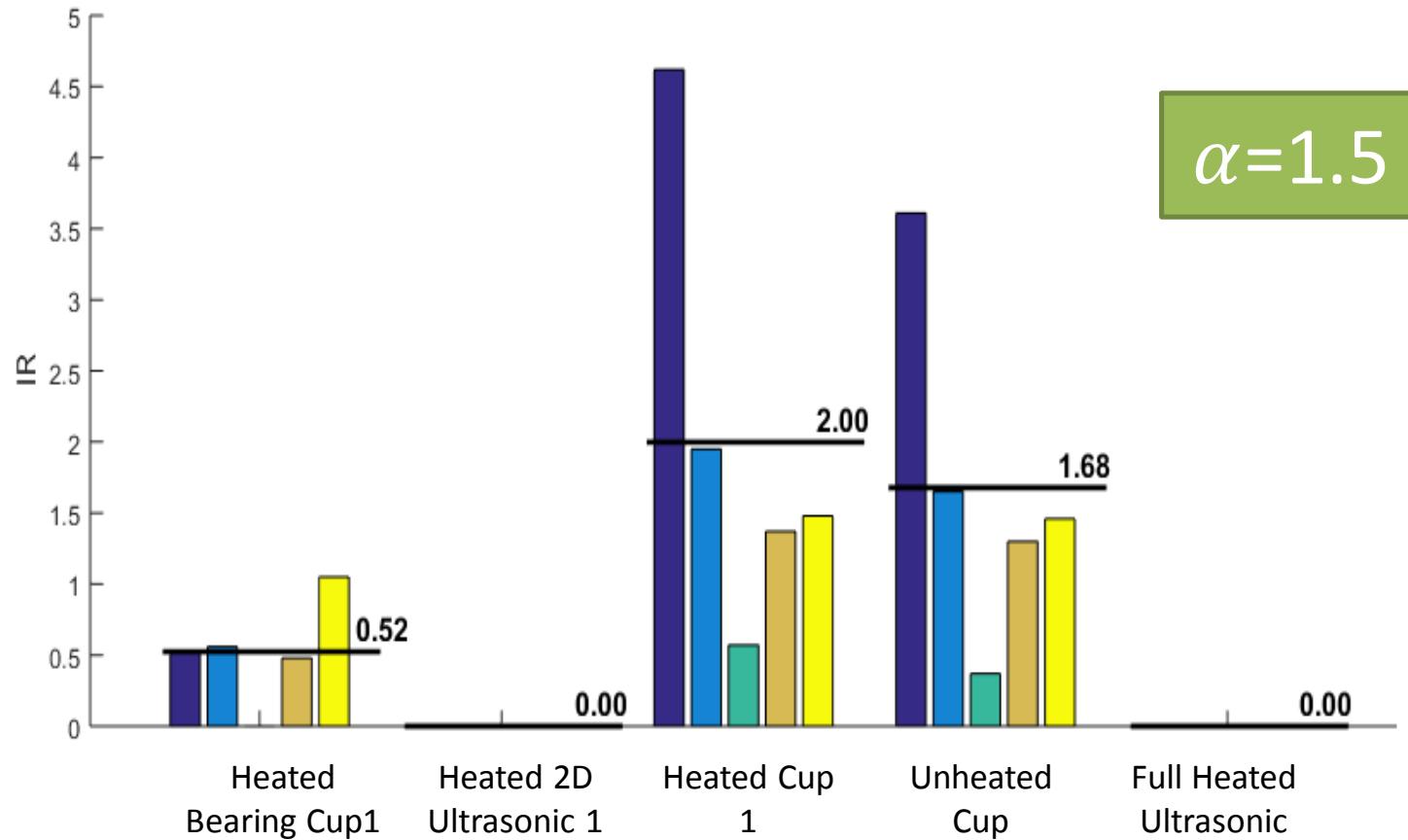
Ice Detection with Image analysis



Measurement based on ISO 12494

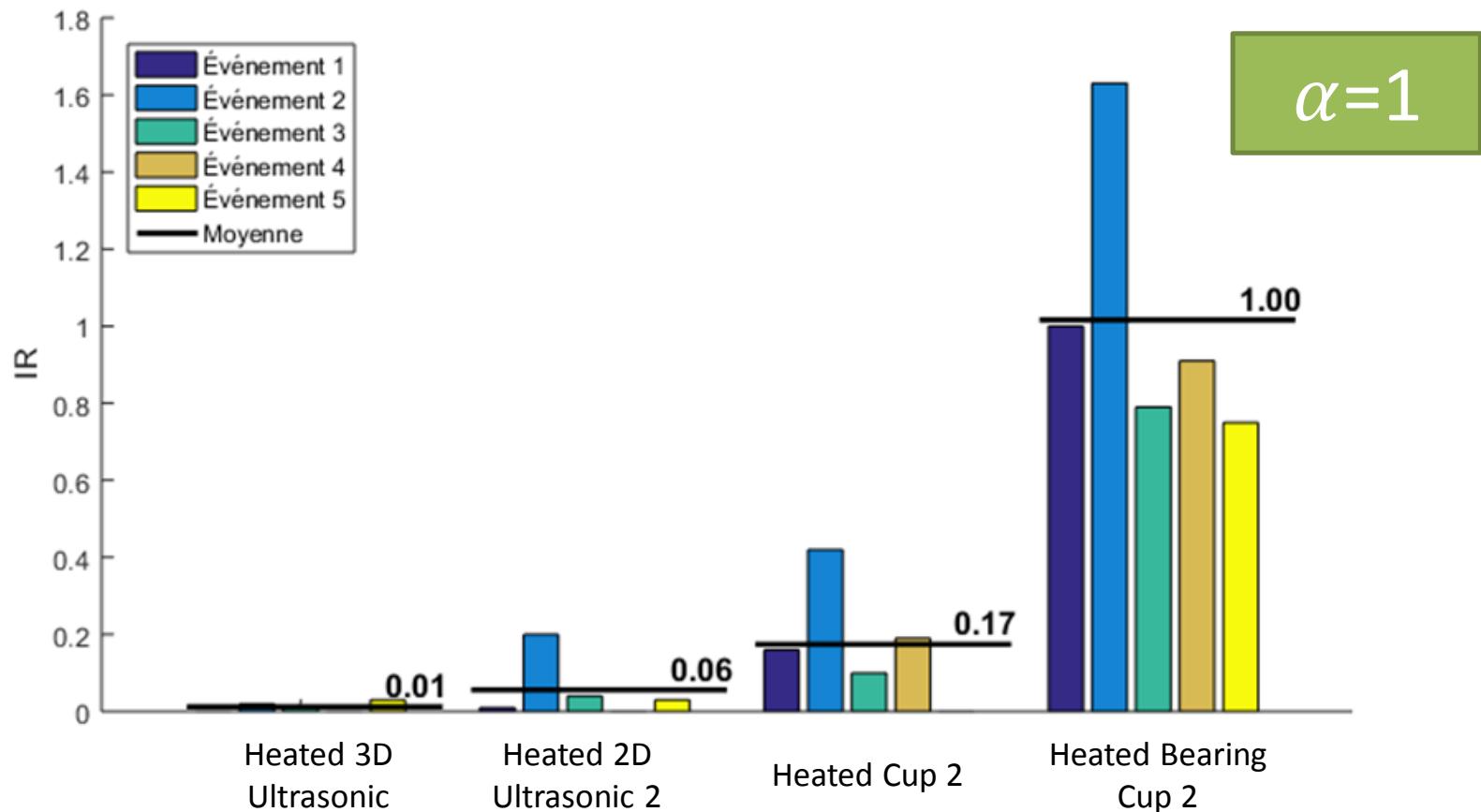
Overall Results

5 events at Rivière-au-Renard in 2015-2016

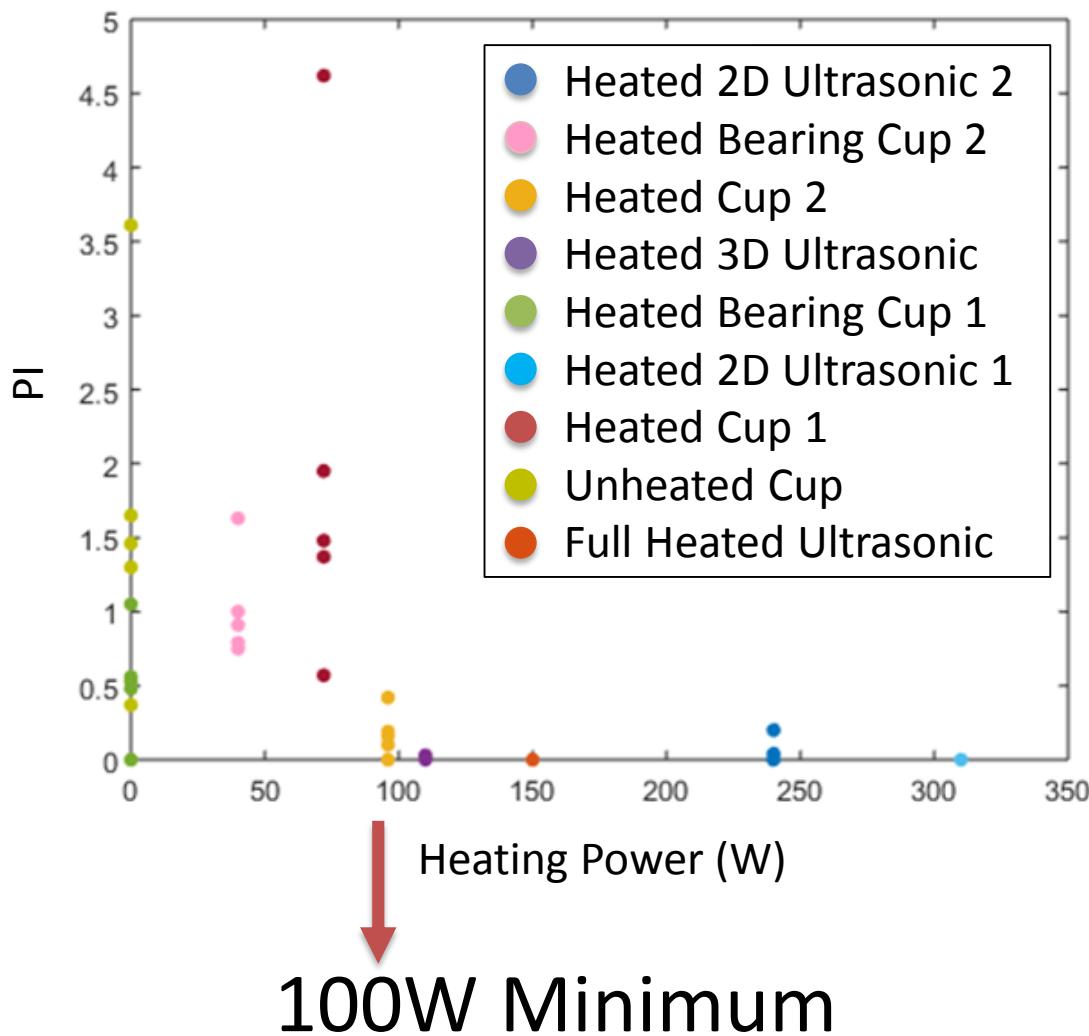


Overall Results

5 events at Murdochville in 2015-2016



Overall Results correlations



What's next?

- More events for winter 2016-2017
- Add new anemometers
- Test more correlations
- Present the PI for ice detectors
- Add ice detector for rotor blades

Merci!

Thank you!



Canada

Canada Economic
Development
for Quebec Regions

Québec