



Wear resistant multi-composite coating for wind power blades

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Introduction



Our team



Prof. Yijun Shi



A. Prof. Marcus Björling



Prof. Pär Marklund



Mr. JunChen

Tribolab



Background



Pictures was referenced from Winter-Wind 2019 and 2020



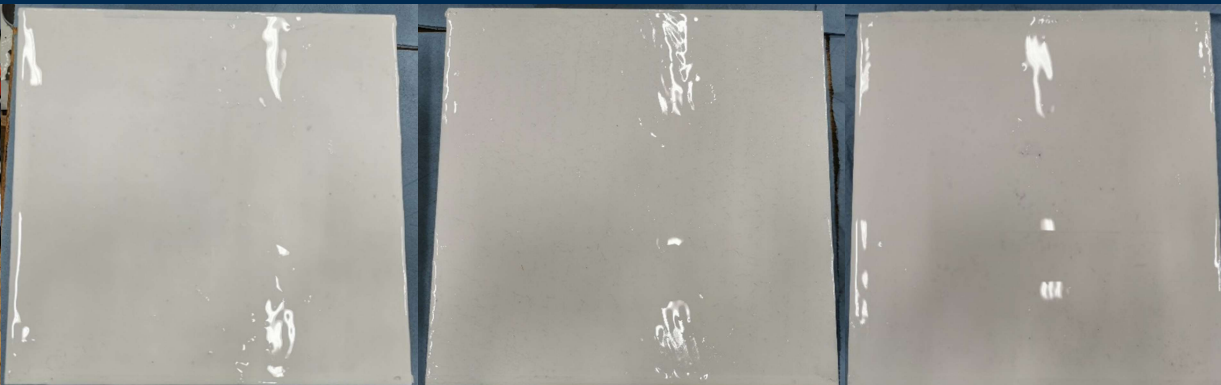


Our Aim

- ◆ Deicing
- ◆ Anti-icing
- ◆ Environment and health friendly (0 VOC)
- ◆ Feasibility
- ◆ Stability



Our Coating

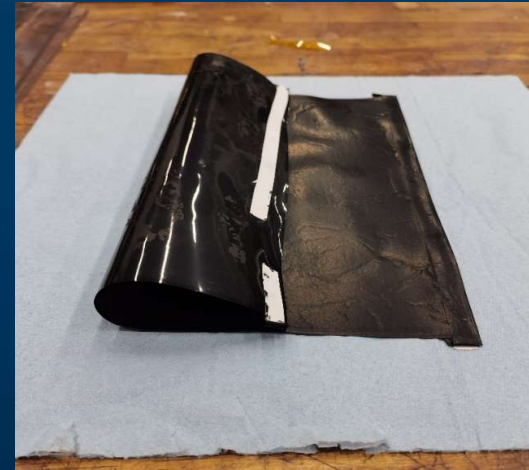


Easy to construct

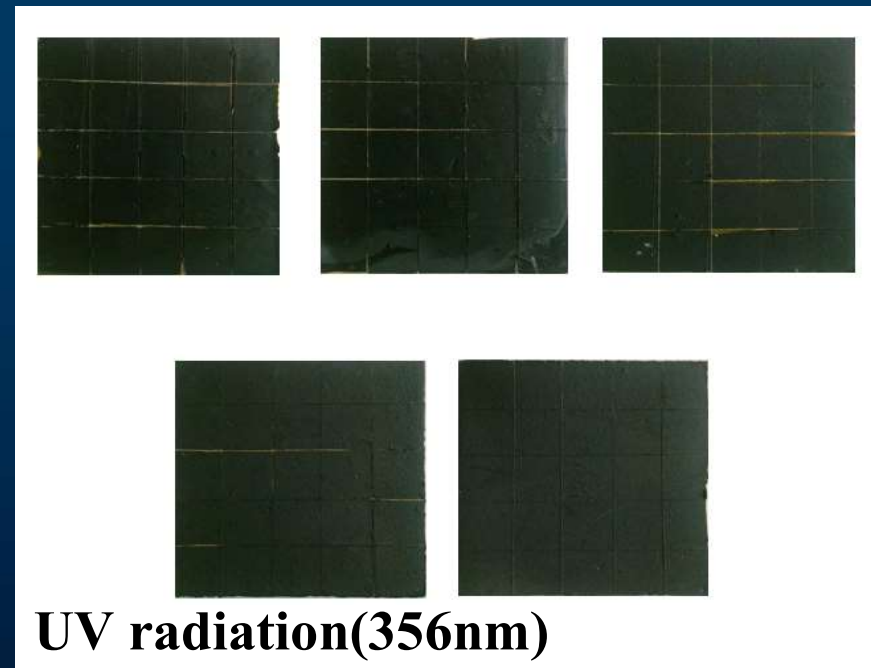
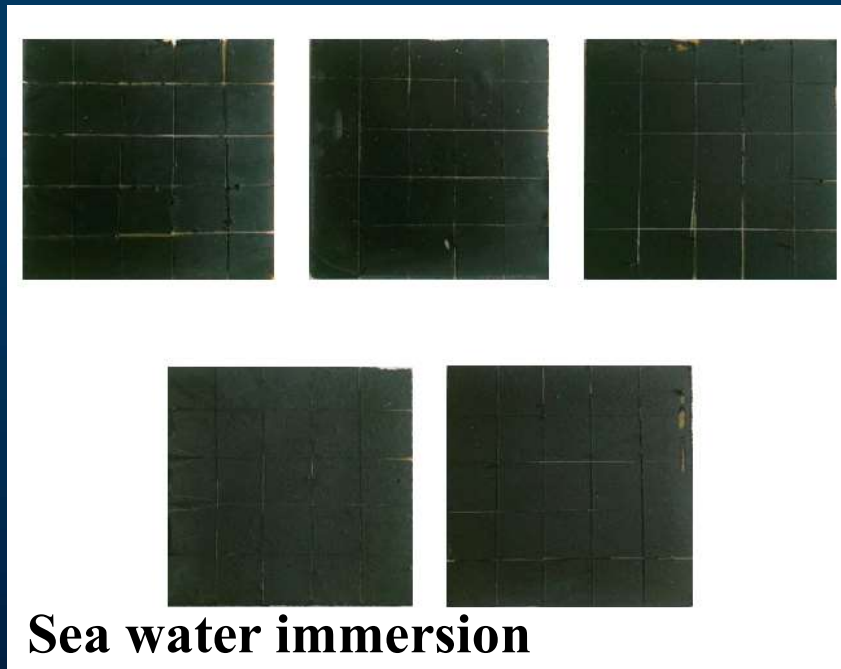


Activities: Spraying coating

Aim: Directly spraying our coating on blades, lower the cost



UV and sea water Aging test(180d)

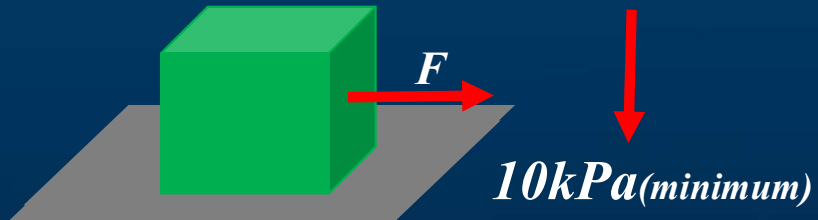


Activities: Accelerated aging test at different condition

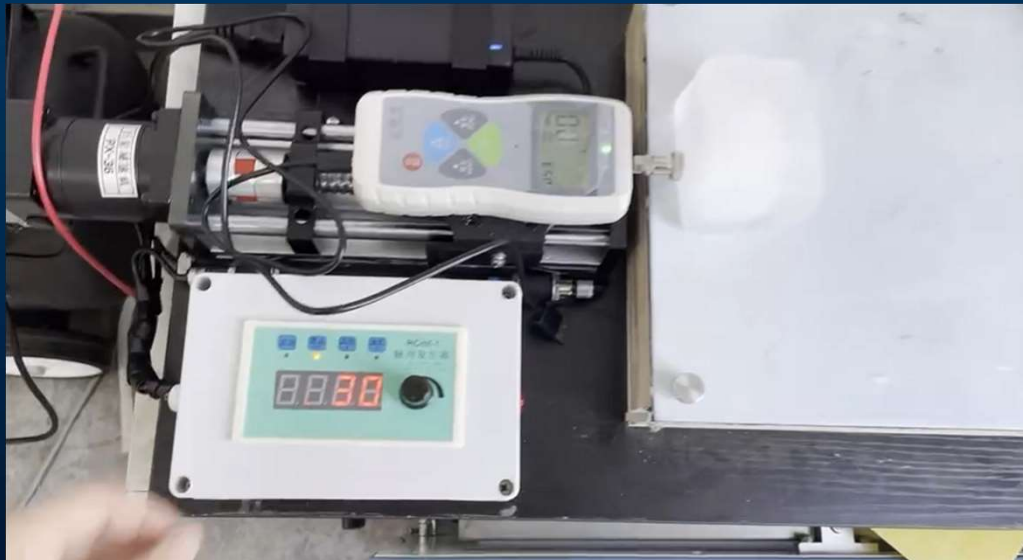
Aim: Aging resistant. The level is 0 (best) (ASTM D3359-09e2)

Ice adhesion

150kPa

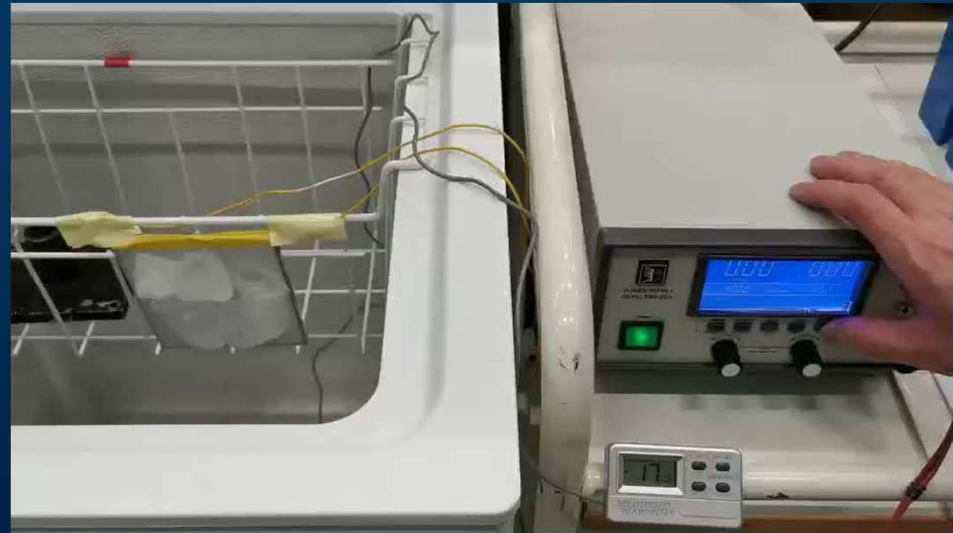
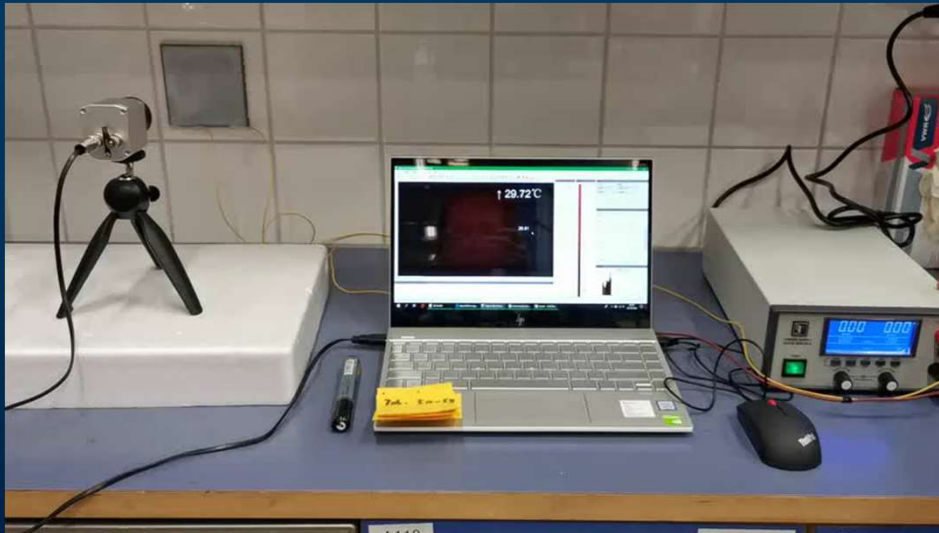


How strong is the ice adhering?



Demo test indoor and inside freezer

Heating in room temperature/60V De-icing in Freezer/70V



Weather condition: Room temperature: 25°C. Freezer condition: -20°C

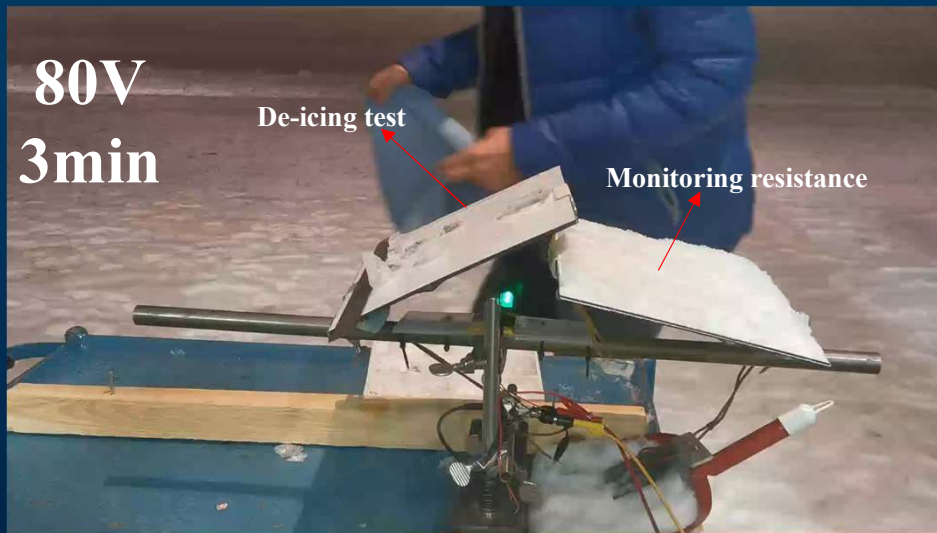
Activities: Heating and De-icing

Aim: Predict de-icing effect



Demo test outdoor

De-icing



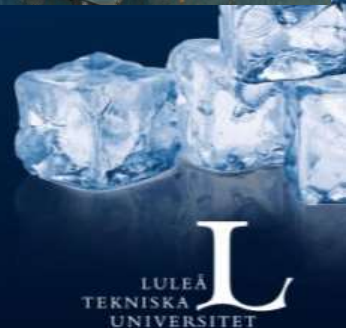
Anti-icing



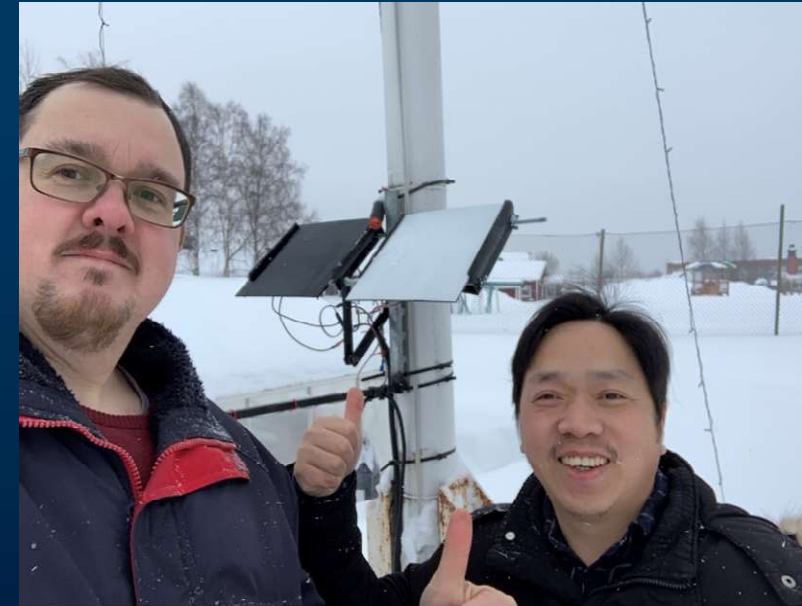
Weather condition: **Snowing, -3°C**

Activities: De-icing at weather condition and Anti-icing test

Aim: Predict deicing effect, test stability, De-icing and Anti-icing at weather condition



Field test outdoor



Activities: Monitor the test through remote control of the camera

Aim: Test anti-/de-ice performance together with weather condition, power consumption recording

Field test outdoor(Video show)

Round 1



Activities: Deicing test outdoor
Aim: Our black coating compared with our white coating

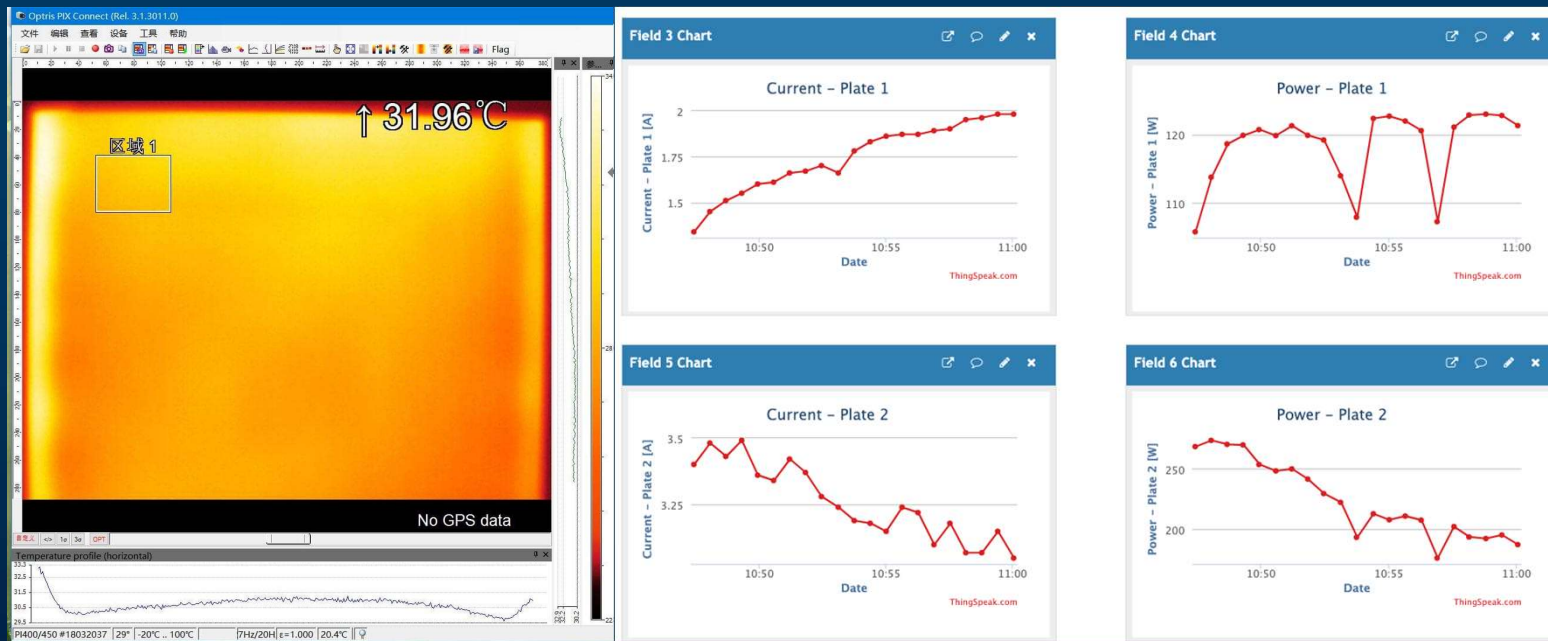
Field test outdoor(Video show)

Round 2



Activities: Deicing test outdoor
Aim: Commercial coating compared with Our white coating

Final Heating distribution



Max Power	1920W/m ²
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Min Power	1760W/m ²
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Max Power	4000W/m ²
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Min Power	3200W/m ²
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Activities: Monitor de-icing effect

Aim: Lower energy consumption (80V-60V with two plates at same time)





Winter Wind 2021

Thank you

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