NWTF
NATIONAL WIND TUNNEL FACILITY

University of BRISTOL

Boundary Layer Wind tunnel

University of Bristol

School of Civil, Aerospace and Design Engineering

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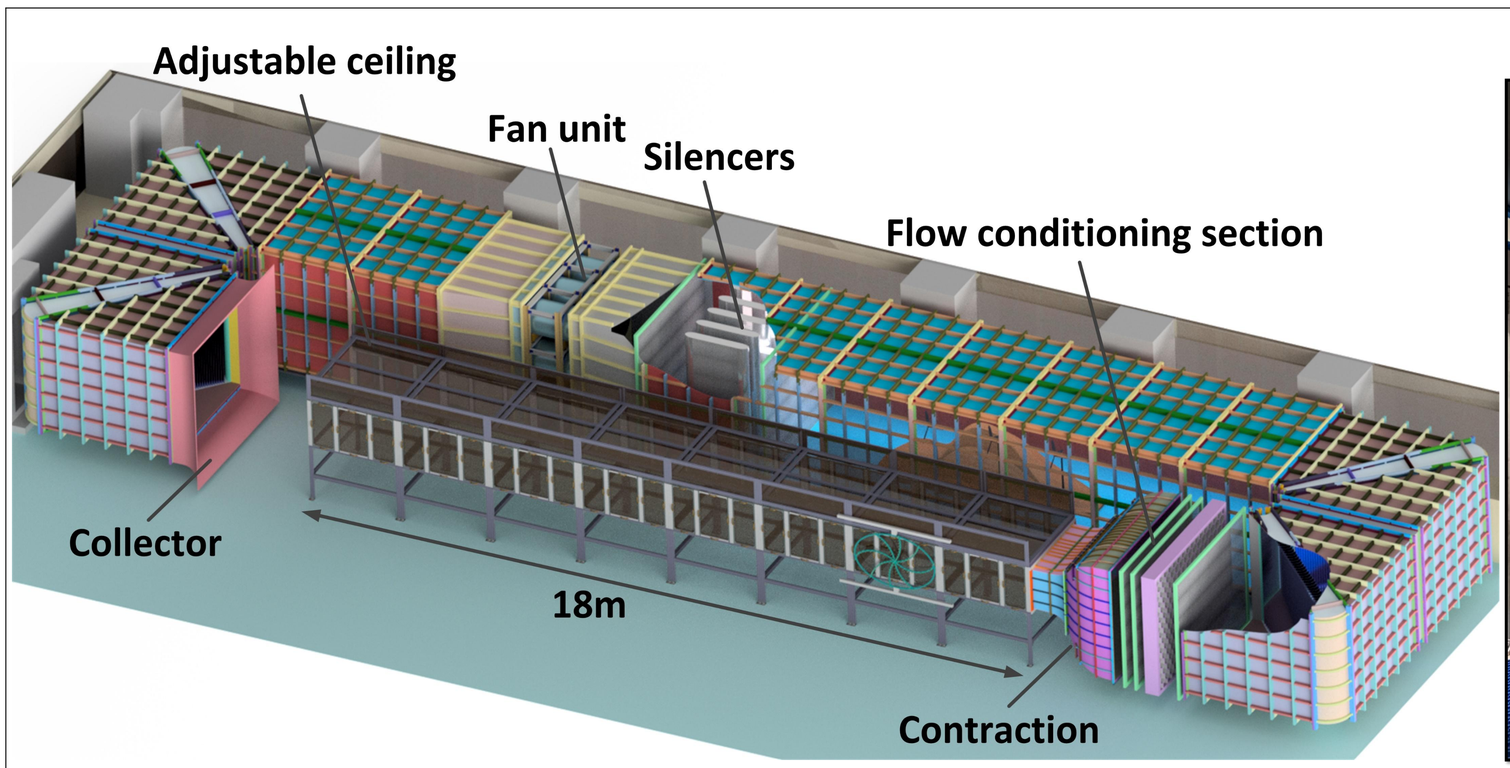
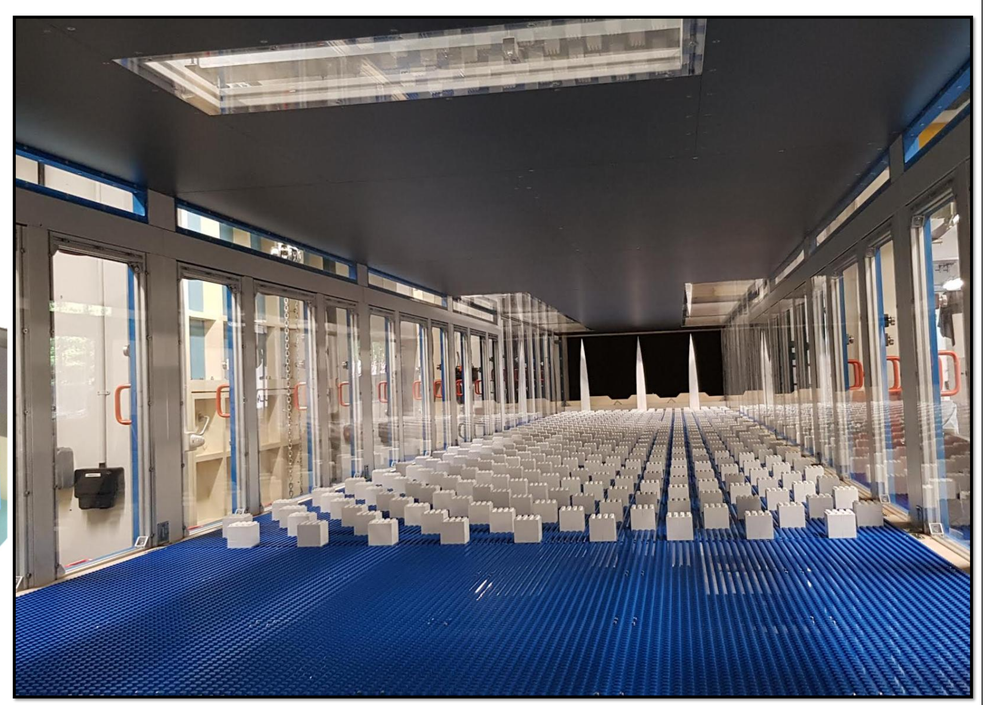




Facility capabilities

- A multi-purpose, closed-circuit, 30-meter long, boundary layer wind tunnel facility, designed with modular components to enable **versatile operations for multi-disciplinary research** which includes fundamental boundary layer flows, applied aerodynamics and aeroacoustics, wind energy, environmental flow and pollution dispersion and atmospheric chemistry research
- Powered by **9 axial fans with a total power of 240kW**, and has a **2m (width) × 1m (height) × 18m (length) test section**
- Multi-fan configuration allows independent operating modes to achieve steady flow velocity of **1.5m/s to 35m/s with low turbulence intensity**
- Equipped with a fully automated tracer gas injection system, capable of onsite blending and the simultaneous release of multiple streams of mixed specialty gases, including hydrocarbons (e.g. propane, butane, ethane) and inert gases (e.g. argon, nitrogen, helium)
- **Unique capabilities** include particle dispersion release and capture mechanisms (FFID), boundary layer suction control, large MEMS-based beamforming arrays, densely populated static and dynamic pressure sensors, drag force plate, acoustically transparent Kevlar wall test section

Research applications

Atmospheric boundary layer flows

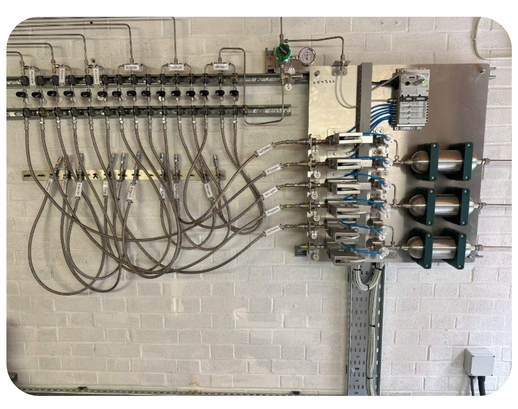
- Develop tools for urban pollution modelling
- Couple laboratory data with real-time air quality data
- Advance understanding on the wake interactions and aeroacoustics of wind turbine farms and develop control strategies

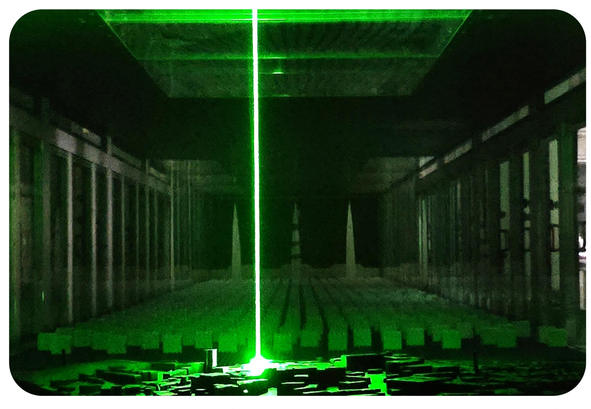
Turbulent mixing and scalar dispersion

- Investigate effects of thermal and mechanical turbulence on scalar transport
- Develop in-house particle dispersion measurement technique
- Study pollutant dispersion under different wind condition
- Investigate particle resuspension under aerodynamic impacts

Fundamentals of wall-bounded turbulence

- Fundamentals of wall-bounded turbulence
- Low-drag surfaces
- Aeroacoustics of wall-bounded turbulent flows





Industrial partners and funding agencies

EPSRC

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center

Environment Agency

ONERA
THE FRENCH AEROSPACE LAB

aerosim

Kalaco
The Climate Consultants

[dstl]
The Science Inside

Horizon2020
European Union Funding for Research & Innovation

GKN AEROSPACE

SAFRAN

Clean Sky 2

DOWTY

Air Quality CONSULTANTS | PART OF Logika Group

EMBRAER