Aerofoil noise directivity investigations

Student Project Proposal

Short description of the project:

- Simulation of wind turbine noise emission uses aerofoil directivity data.
- Applied data is currently based upon standardized directivity patterns for symmetric aerofoils or analytically derived directivity patterns for flat plates.
- Proposed project will investigate directivity on asymmetric aerofoils as most typical used on wind turbine blades

Scope:

Idea behind the proposal is to investigate aerofoil noise emission as function of observer angle relative to aerofoil chord line.

The project will define acoustic wind tunnel test campaigns to apply acoustic array methods for identification of noise emission as function of observer angle relative to chord line. The test campaign will be performed at multiple realistic Mach numbers, and within a realistic range of angles of attack.

Test results will form base for directivity model creation and potentially form base for analytical approaches like Ffowcs , Williams & Hawkings modeling of the directivity.

Focus will be on asymmetric aerofoils.

Other information (not mandatory):

- Master or Phd thesis work depending on analytical level in project
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Keywords

Wind turbine noise, Simulation, Acoustic Wind tunnel testing, Aerofoil noise emission, Acoustic array.

APPLY

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