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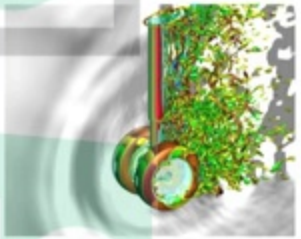
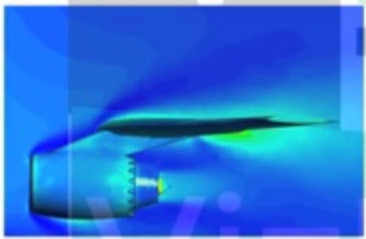
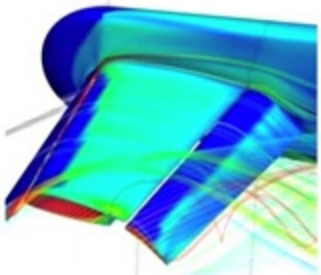
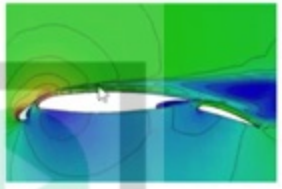
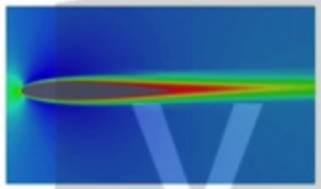
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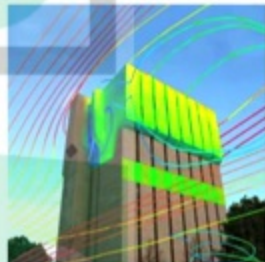
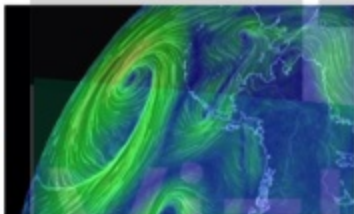
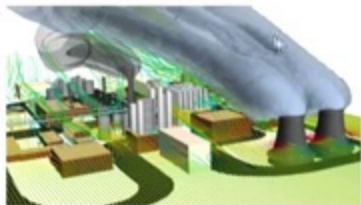
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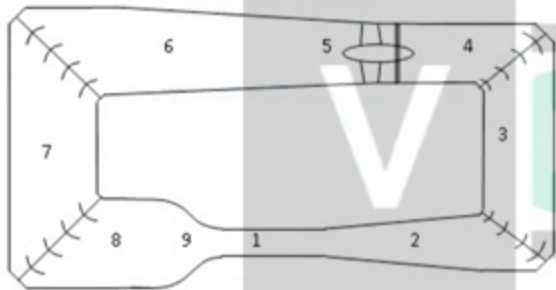
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Environmental engineering:

- **Distribution of pollutants and effluents in the atmosphere**
- **Meteorology: weather prediction**
- **External and internal environment of buildings: wind loading and heating/ventilation**



Experiments



Layout of a low speed closed circuit wind tunnel

- What you see is what you believe – often the most realistic way of solving a flow problem
- Wind tunnels, measuring instruments, model fabrication and instrumentation are costly
- Many quantities may be difficult to measure
- Simultaneous matching of similarity parameters may be difficult if not impossible
- Scale effects



steps involved in performing CFD simulation of a flow problem

- ❑ Problem definition and objectives of performing CFD simulation
- ❑ Choice of governing equations defining the level of the approximation to reality that we would like to simulate
- ❑ Domain definition and discretization- Grid generation (**PRE PROCESSING STEP**)
- ❑ Method of solution of governing equations (*often partial differential equations*) based on suitable initial and boundary condition: e.g., Finite Difference Method (FDM), Finite Volume Method (FVM), Finite Element Method (FEM). Most often, analytical solution does not exist for the problem. Stability and accuracy of the numerical scheme must be analyzed before using it for flow simulation (**FLOW SOLVER STEP**)
- ❑ Analysis of results and validation (**POST PROCESSING STEP**)





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