Ashes is a state-of-the-art aeroelastic tool for onshore, bottom-fixed offshore and floating offshore wind turbines. Its code was validated in the OC3, OC4 and OC5 collaborations and it is the only aeroelastic tool for simulations of multi rotor floaters. Ashes supports two main use-cases:

1. **Initial investigation, concept development, and model creation.** This is done using the Time simulation mode that is highly interactive, real-time and with detailed visualization.

2. **Running a batch with 100s, 1000s or even 10 000s of load cases.** One of the most important use cases of aeroelastic software is running large number of load cases, typically for certification or optimization. The batch mode of Ashes offers fast and easy set up of a new or reuse of an old batch. Most importantly, Ashes offers seamlessly integrated cloud computing. Thus, the simulation speed is increased 10-100X.

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**SUPERPOWERS for engineers**

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1 see OC documents (https://community.ieawind.org/task30/home)
Experience a smooth and easy start
Start from one of the most popular reference wind turbines (NREL 5MW and DTU 10MW) that come pre-built with Ashes and dive directly into a real-time simulation or use them as a starting point for your own turbine model. Reduce your time spent on understanding how to use a software and rather invest it in your research or project.

Never miss a detail with our comprehensive and unique 3D visualization
Our unique and performant 3D visualization makes it easy to understand what forces and moments are acting on your turbine model. Each node along the blade can be further investigated by opening a visualization of the velocity triangle showing all acting forces, angles and the current polar curves.

Advanced local and cloud batch computing
Export batches to comma-separated files and edit your load cases with any software you like, e.g. Excel. When you are done just import them back to Ashes. Easily deploy batch runs in your internal cluster to leverage your existing hardware investments or let them be executed on our cloud servers (e.g. 1000x 10 min simulations for ~30 € in ~15 min). Our cloud computing service is seamlessly integrated and does not require any cloud competence. All data is protected by state-of-the-art security mechanisms and can be stored in long term. Moreover, models can be stored and shared on the cloud.

Highly flexible environmental conditions
Choose from a broad set of environmental models for wind, waves, tides and currents. Ashes provides live, uniform, stepwise, sinusoidal, IEC extreme and turbulent wind. Moreover, it comes with an interface for NREL’s Turbsim and also has an implementation of the Mann turbulence generator. Waves can be modelled as regular and irregular with up to two spectra. In addition custom wave loadings can be applied. Ashes supports up to two currents.

Create and investigate turbulent wind fields
Ashes comes with a user interface for NREL’s Turbsim that makes it possible to easily create custom wind fields and also to investigate these within a comprehensive visualization.

Easy creation of custom airfoils and polars
Ashes provides a handy built-in tool for creation of custom airfoils. In addition, a wrapper around Xfoil makes it possible to directly investigate pressure curves and related coefficients for certain conditions or to create complete sets of polars to be used in time simulations.

Storage of blades and airfoils for reuse
Airfoils and blades can be stored in databases for reuse and handy collaboration. For each airfoil several sets of polars can be saved to account for different conditions or for different data sources (wind tunnel, field test or CFD/PANEL tool data).

Wide online support
Benefit from questions our hundreds of users got already answered in detail in our online Question & Answer forum or browse YouTube for dozens of tutorial videos.

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