Bladed - Generate Turbulent Wind

> ℹ️ **For Cornell MAE 5020 students:**
>
> UPDATE, DECEMBER 3, 2013: It is not possible to run Bladed with turbulent wind in the Swanson Lab. But it is possible to run the turbulent wind cases in the public computer facilities in 318 Phillips, B7 Upson and ACCEL (Carpenter Hall).
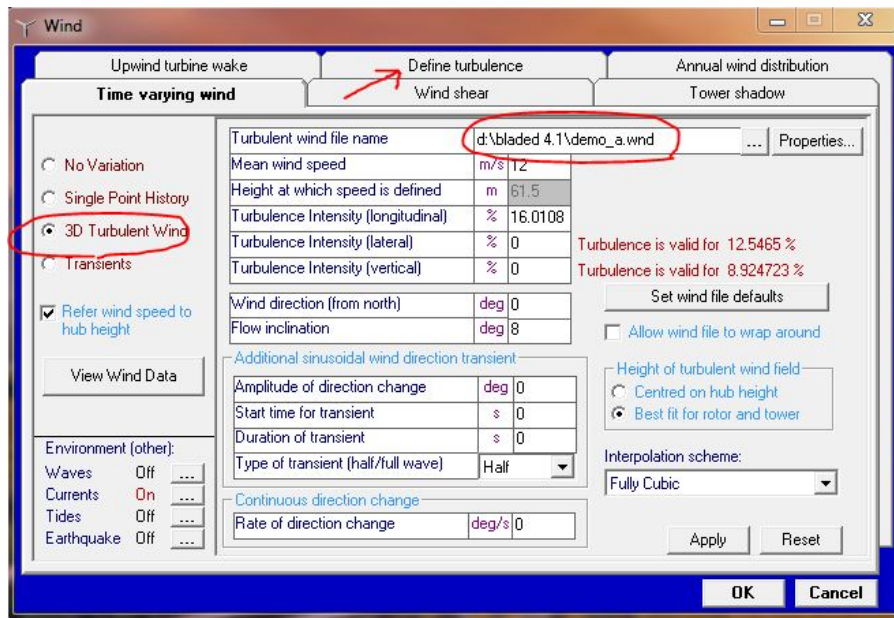
Turbulent Wind

The demo wind turbine uses a turbulent wind for analysis. This tutorial will show the users how to generate a user defined turbulent wind file, which can be used to replace the default turbulent wind.
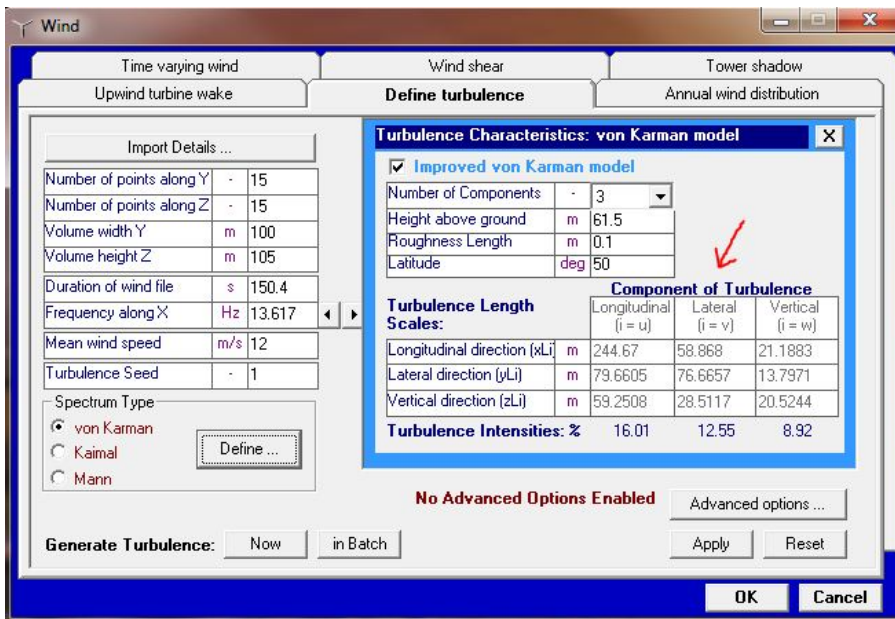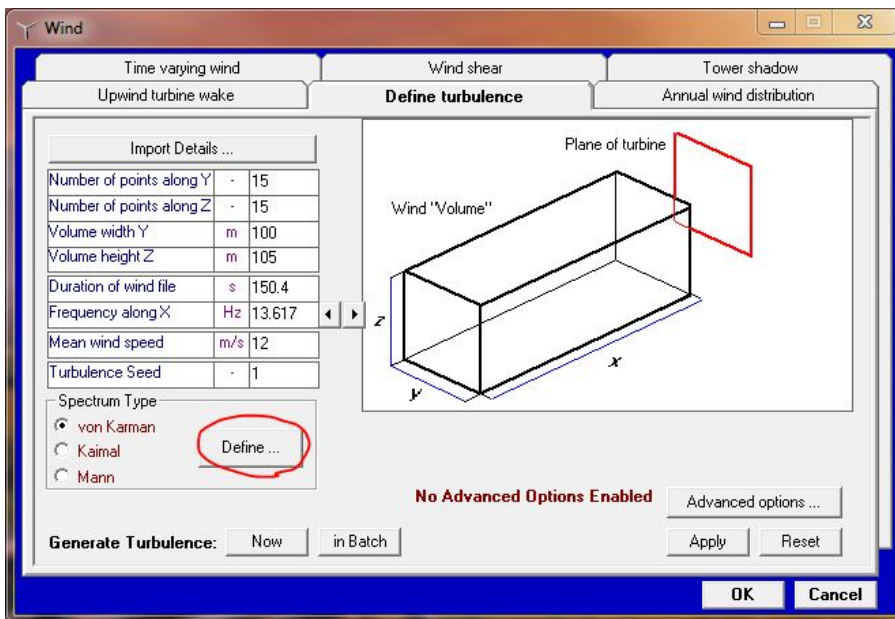
Setup

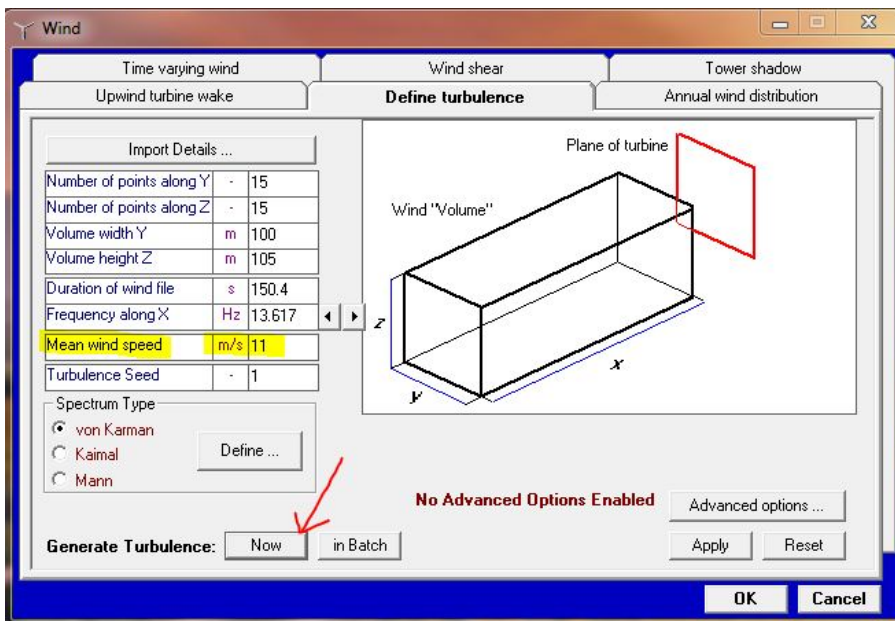Launch GH Bladed and open the demo project and click on the wind icon . The following window will appear:

The default wind in the demo uses a pre-defined turbulent wind file called **demo_a.wnd** and this file is stored in the Bladed directory. We can define a new turbulence wind file in the **Define turbulence** tab, indicated by the arrow.
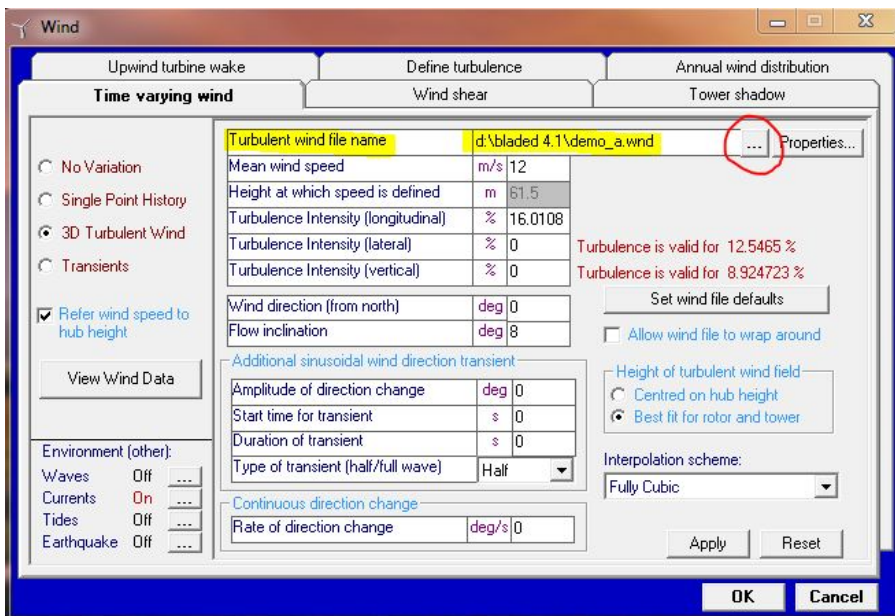
In the **Define turbulence** tab, the default values for the size of the wind field, duration of the wind, frequency, and mean wind speed are displayed. The user is allowed to change these parameters to create a new wind file. Three types of spectrum are available for special cases. The turbulence components in longitudinal, lateral, and vertical direction can be found by clicking on the **Define** tab. However, the educational version of GH Bladed only allows the longitudinal component of turbulence to be used in simulations.

With limited options, we will create a turbulent wind with a different mean wind speed while leaving everything else unchanged. Change the mean wind speed to **11 m/s**. Click on the **Now** button next to **Generate Turbulence**. You will be prompted two dialogues and you may click on OK to proceed. Save the wind file in the desired directory.

To replace the default wind file with the user-defined wind file, click on the *Time varying wind* tab. Use the browse button to locate the file you have generated and replace the default wind file (demo_a.wnd).

Click on OK to finish.