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Detached-eddy and large-eddy simulations of wind effects on a high-rise structure

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## Highlight

- Carry out a combined wind tunnel test and CFD study on the wind effects on an elliptical cylinder
- Investigate the surface roughness effects on the wind loading of an elliptical cylinder using DES
- DES and LES models and numerical treatments adopted in this study can provide reasonably good correspondence with wind tunnel tests
- DES model can reproduce the effects of surface roughness effects on the wind loading with the modified wall function

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