
CARDAAV

Comparison with Experimental and CFD Results

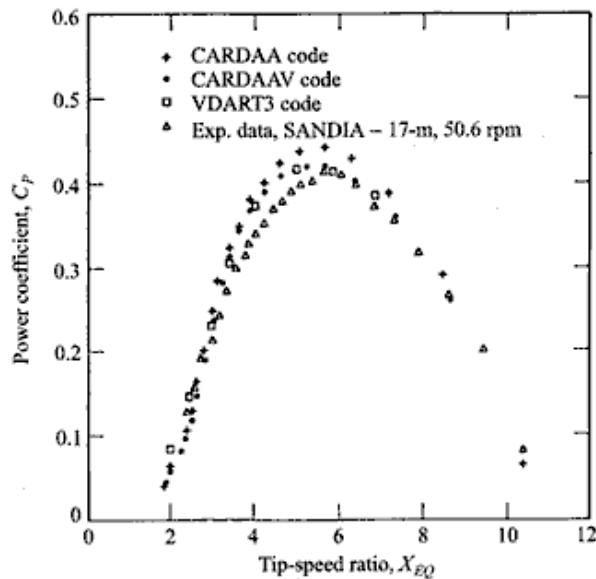


Figure 1 : Power coefficient as a function of the tip-speed ratio. Comparison between experimental data and results predicted by CARDAV, CARDAAV and VDART3 codes (from Ref. [1] p. 185)

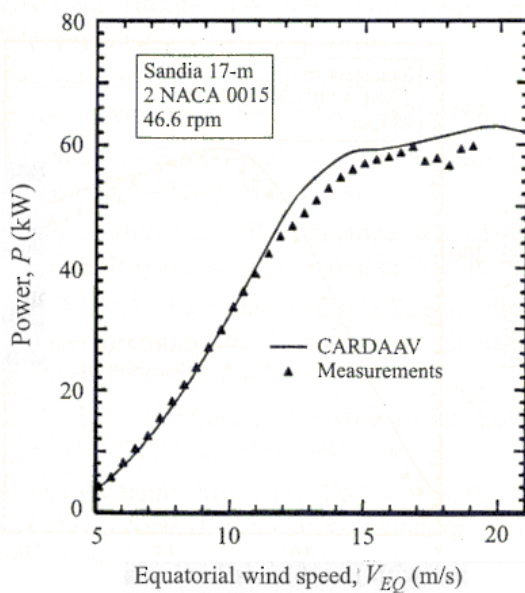


Figure 2: Performance predictions: Scandia 17-m at 46.6 rpm (from Ref. [1] p. 257)

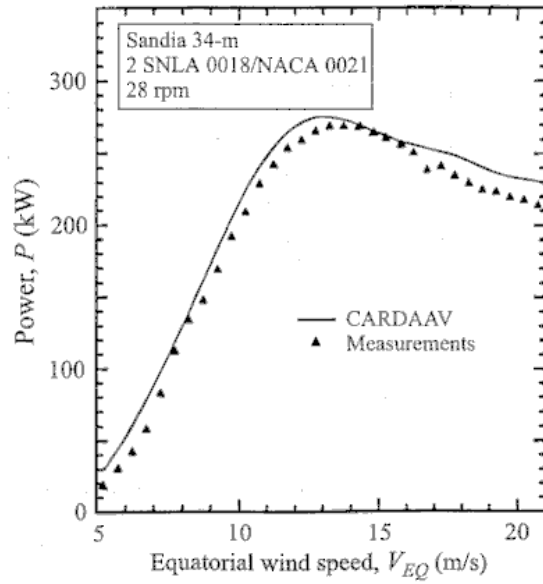


Figure 3: Performance predictions: Magdalen Island rotor at 29.4 rpm (from Ref. [1] p. 258)

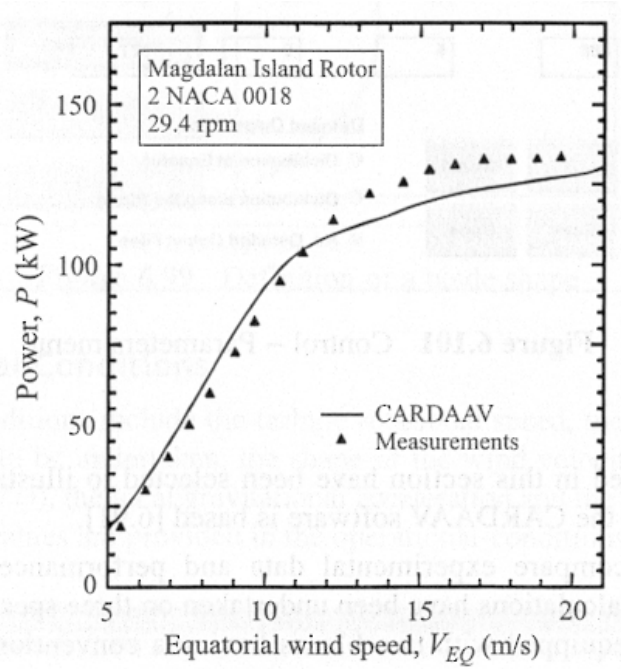


Figure 4: Performance predictions: Sandia 34-m at 34.0 rpm (from Ref. [1], p. 258)

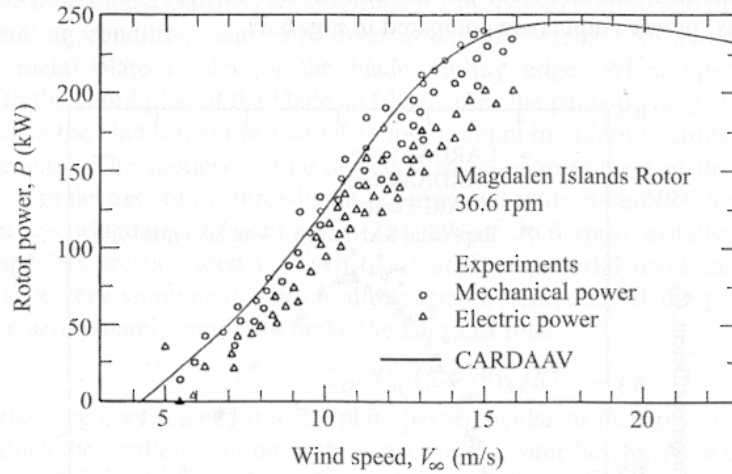


Figure 5: Aerodynamic power as a function of wind speed at the equator. Comparison between experimental data and results predicted by CARDAAV code, including secondary effects (from Ref [1], p. 186)

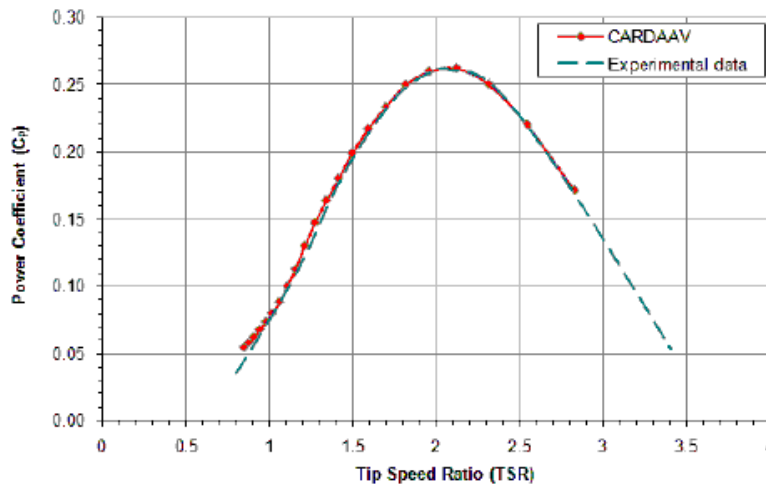


Figure 6: Power coefficient as a function of the tip-speed ratio for a H-Darrieus VAWT with a rotor solidity of 33%. Comparison between experimental data and CARDAAV results.

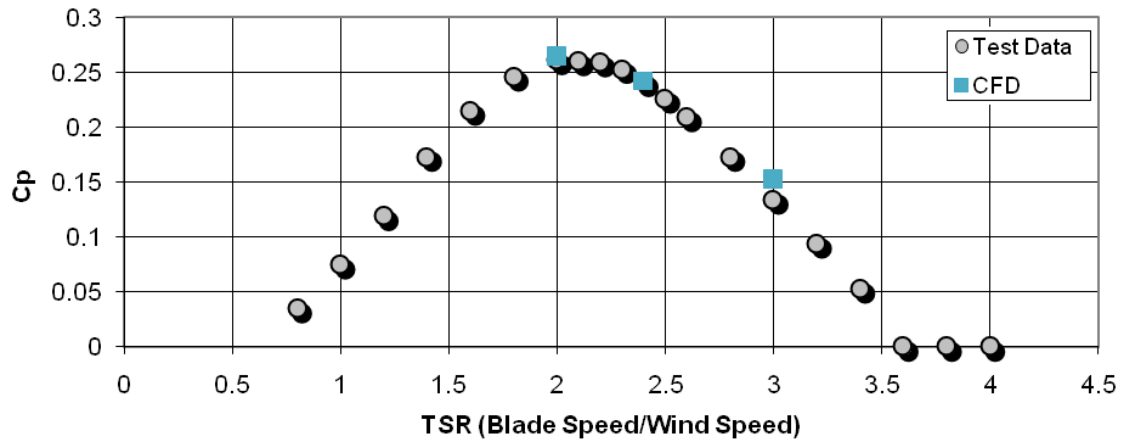


Figure 7: Power coefficient as a function of the tip-speed ratio for a H-Darrieus VAWT with a rotor solidity of 33%. Comparison between experimental data and CFD results.

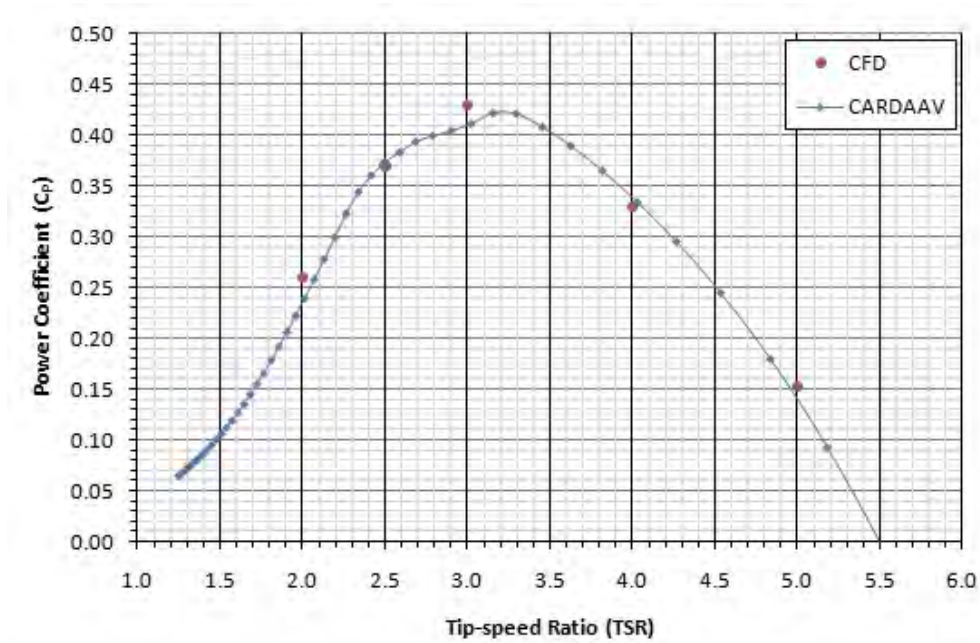


Figure 8: Power coefficient as a function of the tip-speed ratio. Comparison between CFD and CARDAAV results for a H-Darrieus VAWT with a rotor solidity of 16.5%

Table 1: Power coefficient comparison between CFD and CARDAAV for the H-Darrieus VAWT with a rotor solidity of 16.5% [Figure 8]

<i>TSR</i>	<i>CFD</i>	<i>CARDAAV</i>
2.0	0.26	0.24
2.5	0.38	0.37
3.0	0.43	0.41
4.0	0.33	0.34
5.0	0.153	0.138

Note: Each CFD calculation for one TSR takes approximately 4 days on an 8 processors computer. For the CARDAAV code, each TSR takes less than 1 second to calculate on a 4 processors computer.

REFERENCE

- [1] Paraschivoiu, I. (2002). *Wind Turbine Design with Emphasis on Darrieus Concept*. Montreal: Polytechnic International Press.