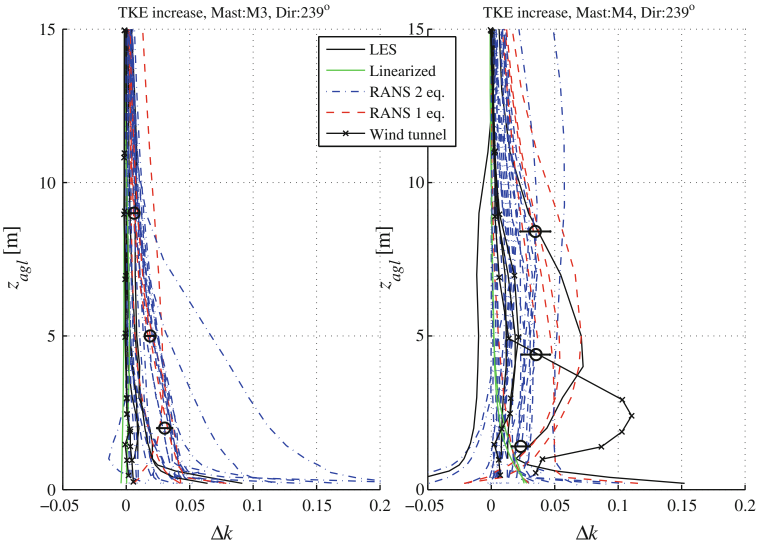

Fig. 10 *Left*: Simulated and measured TKE increase at M3. Right: TKE increase at M4

Table 4 Mean absolute TKE error (see Eq. 16) for each model type for all sonics for all four simulation cases and case 1 and 3

	All cases	Case 1 + 3
RANS 2 eq.	36.9 (21.6)	47.0 (29.9)
LES	35.9 (34.6)	48.0 (41.6)
RANS 1 eq.	36.4 (32.4)	44.7 (42.7)
Experiment	–	61.4 (59.4)
Linearized	58.8 (54.6)	76.7 (71.4)
All models	38.3	49.5

The numbers in parentheses denote error for the highest performing model of the particular model type

experimental methods performed well in capturing the speed-up, they failed to capture TKE. The opposite occurs for LES, which exhibited large errors on the speed-up but performed slightly better in TKE prediction. It is evident, however, that the RANS two-equation models showed the best performance.

5 Concluding Remarks

Based on the Bolund experiment, four simulation cases were defined, and a blind comparison of microscale flow models was performed. All participants were obliged to operate their models to the best of their abilities within a set of specific guidelines and return their results at 600 positions. Because the Bolund wind speed scales solely with friction velocity, it was possible to calculate ensemble-averaged statistics to compare with the predictions. Fifty-seven model predictions were submitted from all branches of the wind-energy industry, showing that the validation of microscale models is a subject of concern for many. Seventy-five percent of the predictions were made using non-linear CFD, which were mostly RANS with the two-equation k–ε turbulence model. This study clearly indicates that CFD has been