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Simulation of the Flow past a Circular Cylinder Using an Unsteady Panel Method

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**Highlights**

- The in-house UnSteady Double Wake Model USDWM is presented in the manuscript.
- Sub-, super-, and trans-critical cylinder flows have been successfully simulated.
- The results show a good comparison between USDWM, URANS, and experiments.
- USDWM is capable of capturing the dynamics of the flow.
- USDWM is capable of capturing changes in  $St$ ,  $C_d$  and  $C_p$  for the three regimes.

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