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Three-component POD of an axisymmetric wake behind a disk
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Department of Applied Mechanics, Chalmers University of Technology, Gothenburg
- Sweden, SE-412 96 — A comparison between the one- and three- component
Proper Orthogonal Decomposition (POD) of an axisymmetric wake behind a disk
is presented in this talk. The high Reynolds number axisymmetric wake behind a
disk has previously been studied using one-component (streamwise) POD in a cross-
section of the flow.\footnote{Johansson, P.B.V. and George, W.K., The far downstream evolution of the high
Reynolds number axisymmetric wake behind a disk. Part 2. Slice proper orthogonal
decomposition, Journal of Fluid Mechanics, Accepted for publication, 2005.} It was found that the energetic structure of the axisymmetric
wake can very efficiently be described in terms of POD modes. The POD revealed
that two major features dominated the wake, one peaking at azimuthal mode-1
and at the Strouhal frequency and the other at azimuthal mode-2 and at near-zero
frequency. The mode-1 peak dies off faster than the mode-2 peak, so that the far
wake ($x/D \geq 50$) is dominated by the latter. The aim of the present investigation
is to find out if three- dimensional decomposition shows the same features as the
one-dimensional.

\footnote{Johansson, P.B.V. and George, W.K., The far downstream evolution of the high
Reynolds number axisymmetric wake behind a disk. Part 2. Slice proper orthogonal
decomposition, Journal of Fluid Mechanics, Accepted for publication, 2005.}

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