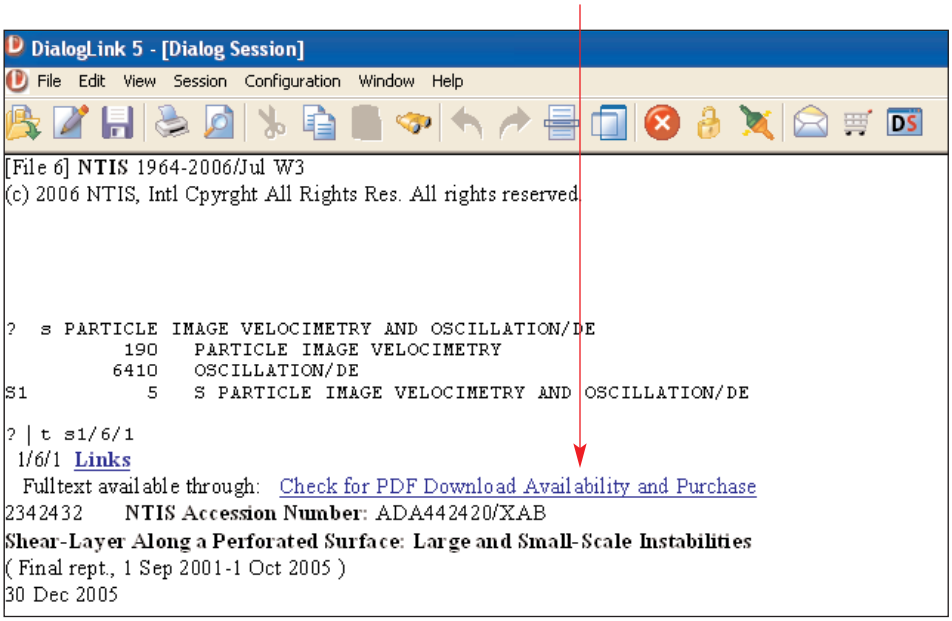
QUICK REFERENCE CARD

Linking to NTIS Reports

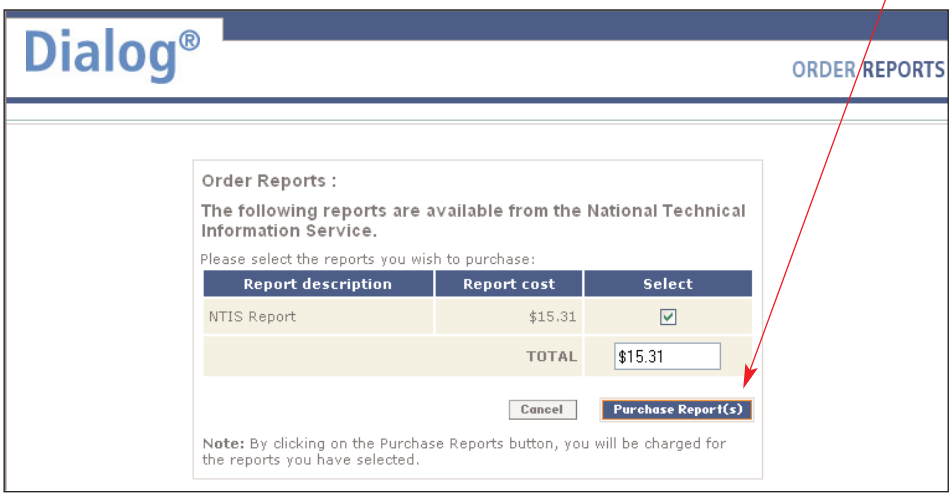
The following steps show how to retrieve a report in PDF format from NTIS (File 6) using the linking feature in DialogLink 5® and other Dialog Web-based products.

Step 1: Perform a search in NTIS (File 6). For this example, we want to retrieve a report on the use of particle image velocimetry to measure oscillation.

Step 2: Once the set (S1) is created, type out a few records in Format 6 to see the titles. Select a title and check to see if a report is available by clicking the link that appears at the top of the record.

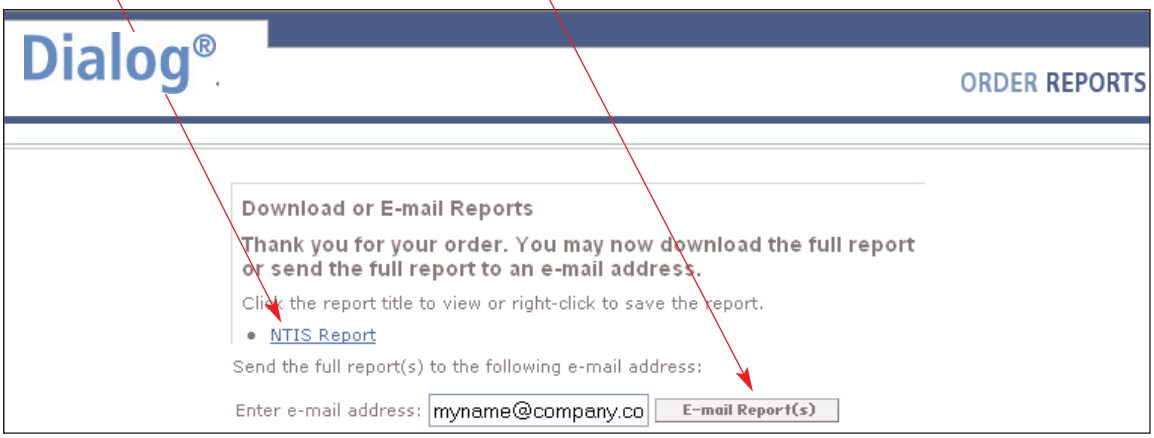


Step 3: From the Order Reports screen, click Select to choose the report. Your total cost will display. Click the check box next to the report you want to purchase and click Purchase Report(s).

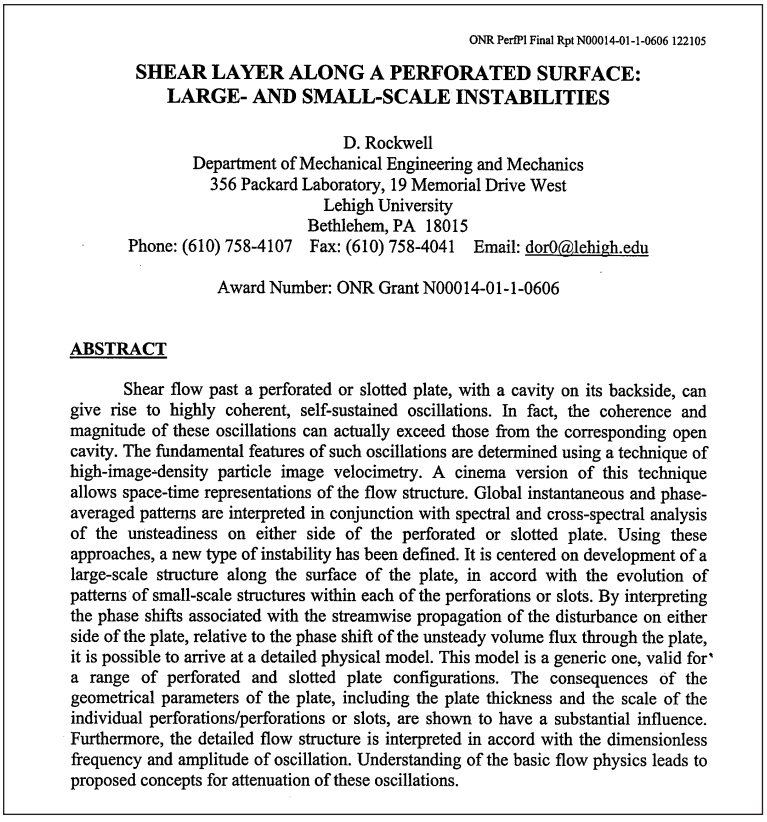


Linking to NTIS Reports (CONTINUED)

Step 4: Enter an e-mail address and click E-mail Report(s) to send the report to a recipient or right-click the NTIS Report link to save or view the report.



The report ordered is delivered as a PDF attachment. All report pages are included: text, images, figures, graphics and references.



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SHEAR LAYER ALONG A PERFORATED SURFACE: LARGE- AND SMALL-SCALE INSTABILITIES

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ABSTRACT

Shear flow past a perforated or slotted plate, with a cavity on its backside, can give rise to highly coherent, self-sustained oscillations. In fact, the coherence and magnitude of these oscillations can actually exceed those from the corresponding open cavity. The fundamental features of such oscillations are determined using a technique of high-image-density particle image velocimetry. A cinema version of this technique allows space-time representations of the flow structure. Global instantaneous and phase-averaged patterns are interpreted in conjunction with spectral and cross-spectral analysis of the unsteadiness on either side of the perforated or slotted plate. Using these approaches, a new type of instability has been defined. It is centered on development of a large-scale structure along the surface of the plate, in accord with the evolution of patterns of small-scale structures within each of the perforations or slots. By interpreting the phase shifts associated with the streamwise propagation of the disturbance on either side of the plate, relative to the phase shift of the unsteady volume flux through the plate, it is possible to arrive at a detailed physical model. This model is a generic one, valid for a range of perforated and slotted plate configurations. The consequences of the geometrical parameters of the plate, including the plate thickness and the scale of the individual perforations/perforations or slots, are shown to have a substantial influence. Furthermore, the detailed flow structure is interpreted in accord with the dimensionless frequency and amplitude of oscillation. Understanding of the basic flow physics leads to proposed concepts for attenuation of these oscillations.

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