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An Experimental Study of Near Wake Structure Behind Two Circular Cylinders with Heat Addition GEORGE LAUGHLIN, SANJAY KUMAR, CESAR CANTU, Department of Engineering, The University of Texas at Brownsville — In this study, we present flow visualization data on the effect of heat addition on the near wake structure behind two identical circular cylinders separated in the span-wise direction perpendicular to the flow at Re = 350. Flow visualization is done using the hydrogen bubble technique. The spacing between the two cylinders is T/D = 1.7, where T = center-to-center spacing and D = cylinder diameter. The gap flow is known to be intermittently bi-stable at this spacing, which is clearly demonstrated in the study. The present study focuses on the response of the gap flow to the heat release in one cylinder. The study shows clearly that the gap flow deflects towards the heated cylinder resulting in a narrower wake behind the heated cylinder as compared to the wake behind the unheated cylinder. The response of the gap-flow is further demonstrated by turning the heat off on one cylinder and switching the heat on the other cylinder resulting in the gap flow deflection as well. The cylinders in the present experiments are heated by joule heating with an estimated wall temperature difference of 30°C in water at the given Reynolds number resulting in Richardson number of about 0.2 in the present experiments.

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