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AUTHOR'S RESPONSE TO 'DISCUSSION OF "APPLICATION OF SECOND-MOMENT TURBULENCE CLOSURE TO HEAT AND MASS TRANSPORT IN THIN SHEAR FLOWS"'

READERS of the Journal will be grateful to Professor Antonia for bringing to their attention the inaccessible conference paper by Dahn and himself [3]. If I correctly read between the lines of the discussion, Professor Antonia seems to be saying that *his* calculations succeed in achieving satisfactory agreement with both the mean temperature and heat flux fields whereas the results presented by Dr. Samaraweera and myself are only satisfactory for the heat flux profiles.

Here the point to emphasize is that the y-direction heat flux and the temperature distribution are not independent characteristics of the thermal boundary layer: prescription of one fixes the other through the enthalpy transport equation. In the Launder–Samaraweera calculations, y- (and x-) direction heat fluxes, beyond the initial region, were in nearly complete agreement with the experiments. The disparity between the measured and calculated temperature fields thus largely reflects an inconsistency between the measured temperature and heat flux distributions due, not to experimental error, but, as Samaraweera and I suggest in the paper, to a mild lack of two-dimensionality of the measured boundary layer. The calculations of [3] effectively "share out" the inconsistency between the two profiles, partly by adopting a larger turbulent Prandtl number over the outer region, which has the effect of reducing $\overline{vc}$ (worsening agreement with data) and steepening the slope of the temperature profile (improving it), and partly through using a larger coefficient E_c in the thermal log law.

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