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Linear Control of Turbulent Channel Flow and the Role of Pressure JONATHAN MORRISON, ATI SHARMA, Imperial College, BEVERLEY MCKEON, California Institute Technology — The response of fully turbulent channel flow to global, linear control is examined. Through full-domain sensing on the wall- normal velocity, control is designed to ensure that the perturbations decay monotonically. The physical effect is such that vdU/dy is countered directly. The control is shown to work for flow disturbances of any size and not those small enough to permit linear approximation. When the forcing bandwidth is progressively reduced, control in terms of drag reduction remains effective. The response of the near-wall flow at $y^+ = 15$ to full-domain actuation is examined in detail, with particular emphasis on the pressure field. It is shown that the near-wall pressure fluctuations are attenuated more quickly than those associated with both the velocity and vorticity fields. Reasons for this result are examined, in particular the pressure- gradient fluctuations, which drive the momentum field, are examined.

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