

Abstract Submitted
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Effect of Polymer Additives on Heat Transfer in a Laminar Boundary-Layer Flow¹ EMILY S.C. CHING, The Chinese University of Hong Kong, ROBERTO BENZI, Universita Tor Vergata, VIVIEN W.S. CHU, The Chinese University of Hong Kong — We have carried out a theoretical analysis of the effect of polymer additives on heat transfer in a laminar boundary-layer flow. We consider the simple Oldroyd-B model of polymers and show that the effect of the polymers can be understood as a position-dependent effective viscosity. We find that the presence of polymers leads to a reduction in the Nusselt number (Nu), the dimensionless number measuring heat transport. Moreover, the extent of reduction increases with the concentration of the polymers. We shall also discuss the relevance of our work to the recent experimental observation of a decrease in Nu in turbulent thermal convection upon the addition of polymers.

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