

Abstract Submitted  
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**Reynolds shear stress near its maxima, turbulent bursting process and associated velocity profile in a turbulent boundary layer** NOOR AFZAL<sup>1</sup>, Retired Professor, Aligarh Muslim University, Aligarh 201002, Aligarh — The Reynolds shear stress around maxima, turbulent bursting process and associated velocity profile in ZGP turbulent boundary layer is considered in the intermediate layer/mesolayer proposed by Afzal (1982 Ing. Arch 53, 355-277), in addition to inner and outer layers. The intermediate length scale  $\delta_m = \delta R_\tau^{-1/2}$  having velocity  $U_m = m U_e$  with  $1/2 \leq m \leq 2/3$  where  $U_e$  is velocity at boundary layer edge. Long & Chen (1981 JFM) intermediate layer/ mesolayer scale  $\delta_m = \delta R_\tau^{-1/2}$  with velocity  $U_m$  the friction velocity  $u_\tau$ , is untenable assumption (Afzal 1984 AIAA J). For channel/pipe flow, Sreenivasan et al (1981, 1989, 1997, 2006a,b) proposed critical layer / mesolayer, cited/adopted work Long and Chen and McKeon, B.J. & Sharma, A. 2010 JFM 658, page 370 stated “retaining the assumption that the critical layer occurs when  $U(y) = (2/3) U_{CL}$  (i.e. that the critical layer scales with  $y^+ \sim R_\tau^{+2/3}$ ),” both untenable assumptions, but ignored citation of papers Afzal 1982 onwards on pipe flow. The present turbulent boundary layer work shows that Reynolds shear maxima, shape factor and turbulent bursting time scale with mesolayer variables and Taylor length/time scale.

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