

# Experiments in Fluid Mechanics 2015

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Institute of Aeronautics and Applied Mechanics

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<b>Title of presentation:</b> Amplitude modulation and its relation to convection velocity in turbulent boundary layer
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<b>Abstract:</b> The presentation is devoted to show the relation between amplitude modulation and convection velocity in turbulent boundary layer. It appears that a measure of amplitude modulation of small-scale structures by large-scale structures, which is one of the term of decomposed skewness factor can be used as an indicator of convection velocity of coherent structures. The analysis has been performed based upon velocity profiles measured with hot-wire technique in turbulent boundary layer with pressure gradient corresponding to turbomachinery conditions. The VITA detection method of the small-scale structures was used in order to show the impact of pressure gradient on phase averaged time-traces changes in the aspect of amplitude modulation. It was found that the skewness factor of conditionally averaged time traces of small-scale structures detected by VITA method follow the similar changes as the cross product term of skewness factor. The final results show that this cross product term describes the convection velocity profile in zero pressure gradient turbulent boundary layer when a proper scale is applied. It seems that the scale is constant for different pressure gradient conditions.