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Thoughts on bypass "transition" DONALD M. MCELIGOT, U. Arizona and Uni. Stuttgart — One may consider the situation when a plate is immersed in a fully-turbulent jet. If there is no angle-of-attack, one has effectively a turbulent wall jet with the leading edge region in the near field. This situation describes many experiments examining so-called "bypass transition" – which perhaps could be treated and interpreted in this light. At the surface, turbulent fluctuations become zero thanks to the no-slip condition while the free stream is completely turbulent – in contrast to the steady laminar free stream of "natural" transition. In the limit of "high" free stream turbulence levels, the situation described is probably not one of conventional laminar-to-turbulent transition but rather one of suppression of turbulent flow approaching a surface. Is there really a laminar boundary layer in the near field or just the viscous layer of a turbulent wall flow? In some ways it may be comparable to "laminarization" of a turbulent boundary layer or duct flow. The study reported explores similarities between observations of bypass transition and those of the viscous layer of a turbulent wall flow.

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