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# **Boundary Layer Theory and Exponential Asymptotics**

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In 1904, Prandtl introduced the boundary layer method (matched asymptotics) which has become one of the most important tools in applied mathematics. Despite its usefulness, there still does not seem to have a rigorous analysis to validate the accuracy of Prandtl's treatment. In this lecture, we will point out that when exponentially small terms are taken into consideration, errors can occur even in very well-known formulas in boundary layer theory, and present some rigorous results for two non-linear two-point boundary value problems, involving Carrier-Pearson equations.