1078-76-65 **Chunqing Lu*** (clu@siue.edu), Department of Mathematics and Statistics, Southern Illinois University Edwardsville, Edwardsville, IL 62026. *Bifurcation of Solutions to a Boundary Layer Problem.* Preliminary report.

Consider that a plate is semi-infinite with a porous surface and moves at a constant speed U_w in the direction parallel to a uniform stream flow. Assume the stream flow has a constant speed U_∞, and that the same fluid is being injected or sucked. Then the generated laminar flow satisfies one of the Navior-Stoke's equations: $U\frac{\partial U}{\partial X} + V\frac{\partial V}{\partial Y} = \frac{1}{\rho}\frac{\partial \tau_{XY}}{\partial Y}$. Set the shear stress $\tau_{XY} = K\left|\frac{\partial U}{\partial Y}\right|^{N-1}\frac{\partial U}{\partial Y}$ where $K > 0$ and $N \in (0, 1]$ are constant. Introducing a stream function and a similarity variable, we transform the above partial differential equation into an o.d.e

$$\left(|f''(\eta)|^{N-1}f''(\eta)\right)' + f(\eta)f''(\eta) = 0,$$

subject to boundary conditions

$$f(0) = -C, f'(0) = \xi, f'(+\infty) = 1,$$

where $\xi = \frac{U_w}{U_\infty}$, $C = \frac{BV_0(N+1)}{U_\infty}$ for a constant V_0. This paper proves a new sufficient condition for the existence of multiple solutions to the boundary value problem. It does not require the lower boundedness of ξ, which is simpler and different from the known results. (Received November 17, 2011)