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**On a Similarity Boundary Layer Equation**

The purpose of this paper is to study the autonomous third order nonlinear differential equation  $f''' + \frac{m+1}{2} f f'' - m f'^2 = 0$  on  $(0, \infty)$ , subject to the boundary conditions  $f(0) = a \in \mathbb{R}$ ,  $f'(0) = 1$  and  $f'(t) \rightarrow 0$  as  $t \rightarrow \infty$ . This problem arises when looking for similarity solutions to problems of boundary-layer theory in some contexts of fluids mechanics, as free convection in porous medium or flow adjacent to a stretching wall. Our goal here is to investigate by a direct approach this boundary value problem as completely as possible, say studying existence or non-existence and uniqueness or non-uniqueness of solutions according to the values of the real parameter  $m$ . In particular, we will emphasize similarities and differences between the cases  $a = 0$  and  $a \neq 0$  in the boundary condition  $f(0) = a$ .