**Meeting:** 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-76-1688 **John M Russell*** (`john_m_russell_scd@mac.com`), 1321 York Circle, West Melbourne, FL 32904. *Conformal transformation of the independent variable in the differential equation of classical instability of the asymptotic-suction boundary layer.*

The *BMHR equation* (for BUSSMAN, MÜNZ, HUGHES & REID) is the modified ORR-SOMMERFELD (OS) equation that applies when the mean flow is the asymptotic suction boundary layer. D. GROHNE (1950) and P. BALDWIN (1970) found several exact solutions of the OS and BMHR equations, resp. In the mean time W.D. LAKIN & W.H. REID (1982) (L&R) found uniform asymptotic solutions of the BMHR equation. L&R transformed the original independent variable, $z$, to a LANGER variable, $\eta$, and grouped solutions of the differential equation in terms of their respective asymptotic properties in the $\eta$-plane. Thus, three solutions are *recessive* as $\eta \to \infty$ in adjoining sectors of the $\eta$-plane, three are *balanced* (*i.e.* have inviscid character) in three other adjoining sectors, and one is *well-balanced* (*i.e.* has the character of the regular inviscid solution) over the whole disk in the $\eta$-plane. To relate the family defined by L&R to available exact solutions one must construct a suitable conformal transformation between the $z$-plane and the $\eta$-plane. This talk identifies where the singular points and cuts of this transformation should be located. (Received October 06, 2004)