

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

1003-49-1386      **Ivie Stein, Jr.\*** (Ivie.Stein@utoledo.edu), Math. Dept., UH 2040, Mail Stop 942, The University of Toledo, 2801 W. Bancroft St., Toledo, OH 43606-3390. *Singular quadratic functionals applied to the axially symmetric pendant and sessile drops*. Preliminary report.

The purpose of this paper is to apply the ideas of Marston Morse and Walter Leighton in Singular quadratic functionals, Trans. Amer. Math. Soc. 40 (1936), no. 2, 252-286, to some specific problems in the calculus of variations, namely, the determination and the numerical calculation for the stability of the axially symmetric pendant and sessile drops. As an example, singular conjugate points are determined and computed numerically for a pendant drop with a volume constraint. References include those by Robert Finn in Equilibrium capillary surfaces, Grundlehren der Mathematischen Wissenschaften, 284, Springer-Verlag, New York, 1986, and Henry Wente in The stability of the axially symmetric pendant drop, Pacific J. Math. 88 (1980), no. 2, 421-470, and in Stability for the Axially Symmetric Pendant Drop, MPI/87-37, Max-Planck-Institute für Mathematik, Bonn, West Germany, where on page 11 a strong minimum is shown. (Received October 05, 2004)