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Katarina Jegdic* (kjegdic@math.uh.edu), Univ. of Houston, Dept. of Mathematics, 651 Philip G. Hoffman Hall, Houston, TX 77204, **Barbara Lee Keyfitz** (bkeyfitz@fields.utoronto.ca), 222 College Street, 2nd floor, Toronto, Ontario M5T 3J1, Canada, and **Suncica Canic** (canic@math.uh.edu), Univ. of Houston, Dept. of Mathematics, 651 Philip G. Hoffman Hall, Houston, TX 77204. *Transonic regular reflection for the isentropic gas dynamics equations.*

We consider a two-dimensional Riemann problem for the isentropic gas dynamics equations and derive regimes for which regular reflection can occur. We restrict our study to transonic regular reflection and write the problem in self-similar coordinates. This change of variables leads to a mixed type system and a free boundary problem for a position of the reflected shock and a subsonic state behind the shock. We analyze this problem using the theory of second order elliptic equations and the fixed point theory. (Received February 07, 2006)