962-35-850   **Suncica Canic*** (`canic@math.uh.edu`), Dept. of Mathematics, University of Houston, Houston, TX 77204-3476, Houston, TX 77204-3476, and **Barbara L Keyfitz** and **Eun-Heui Kim**. *Weak Shock Reflection by a Wedge and the Related Free Boundary Problems.*

In this talk I will report on our recent progress in the study of weak shock reflection modeled by the unsteady transonic small disturbance equation (UTSD)

$$\begin{aligned} u_t + uu_x + v_y &= 0 \\ -v_x + u_y &= 0 \, , \end{aligned} \tag{1}$$

assuming shock reflection initial data $x = ay$ (incident shock), and "no flow through the wall" boundary condition $v(x,0) = 0$. Depending on the parameter "a" different types of reflection occur. We suggest that this problem allows two qualitatively different classes of solutions. One is the well accepted *regular reflection* solution occurring for $a \geq \sqrt{2}$, and the other is a *complex reflection* occurring for $0 < a < \sqrt{2}$. I will state the corresponding free-boundary problems for the positions of the transonic shocks in each class, and suggest a strategy for proof of the global existence of a solution. We have successfully completed the proof in the case of regular reflection (the weak and the strong case; the subsonic part of the solution lies in a weighted Hölder space). The details of the proof will be presented in this conference by Eun Heui Kim. The proof for the complex reflection case is still open. I will summarize the main difficulties. (Received September 27, 2000)