Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Schlieren imaging of shock waves radiated by a trumpet[1] PABLO L. RENDON, ROBERTO VELASCO-SEGURA, Centro de Ciencias Aplicadas y Desarrollo Tecnologico, Universidad Nacional Autonoma de Mexico, CARLOS ECHEVERRIA, DAVID PORTA, Facultad de Ciencias, Universidad Nacional Autonoma de Mexico, TEO VAZQUEZ, ANTONIO PEREZ-LOPEZ, Centro de Ciencias Aplicadas y Desarrollo Tecnologico, Universidad Nacional Autonoma de Mexico, CATALINA STERN, Facultad de Ciencias, Universidad Nacional Autonoma de Mexico — The flaring bell section of modern trumpets is known to be critical in determining a wide variety of properties associated with the sound radiated by these instruments. We are particularly interested in the shape of the radiated wavefront, which clearly depends on the bell profile. A horn loudspeaker is used to drive high-intensity sound at different frequencies through a B-flat concert trumpet. The sound intensity is high enough to produce shock waves inside the instrument resonator, and the radiated shocks are then visualised using Schlieren imaging. Through these images we are able to study the geometry of the shock waves radiated by the instrument bell, and also to calculate their propagation speed. The results show that propagation outside the bell is very nearly spherical, and that, as expected, the frequency of the driving signal affects the point at which the shock waves separate from the instrument.

[1]We acknowledge financial support from PAPIIT IN109214 and PAPIIT IN117712.

Pablo L. Rendon
Centro de Ciencias Aplicadas y Desarrollo Tecnologico,
Universidad Nacional Autonoma de Mexico

Date submitted: 31 Jul 2014 Electronic form version 1.4