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Houas et al.

## On the mutual penetrations of two gases submitted to the Richtmyer-Meshkov instability: Part 1 - experiments

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An experimental investigation, based on the laser sheet technique, has been undertaken to study the mutual penetrations of two different density gases, the interface of which is submitted to the Richtmyer-Meshkov instability. Two couples of gases are used to illustrate both heavy/light (air/He) and light/heavy (air/SF<sub>6</sub>) cases. The incident shock wave Mach number is of about 1.31 and gases on both sides of the interface (a 0.4  $\mu\text{m}$  nitrocellulose membrane) are at atmospheric pressure. Two different perturbations (positive and negative) are tested. Experiments will be compared with numerical simulations obtained from CARBUR code.

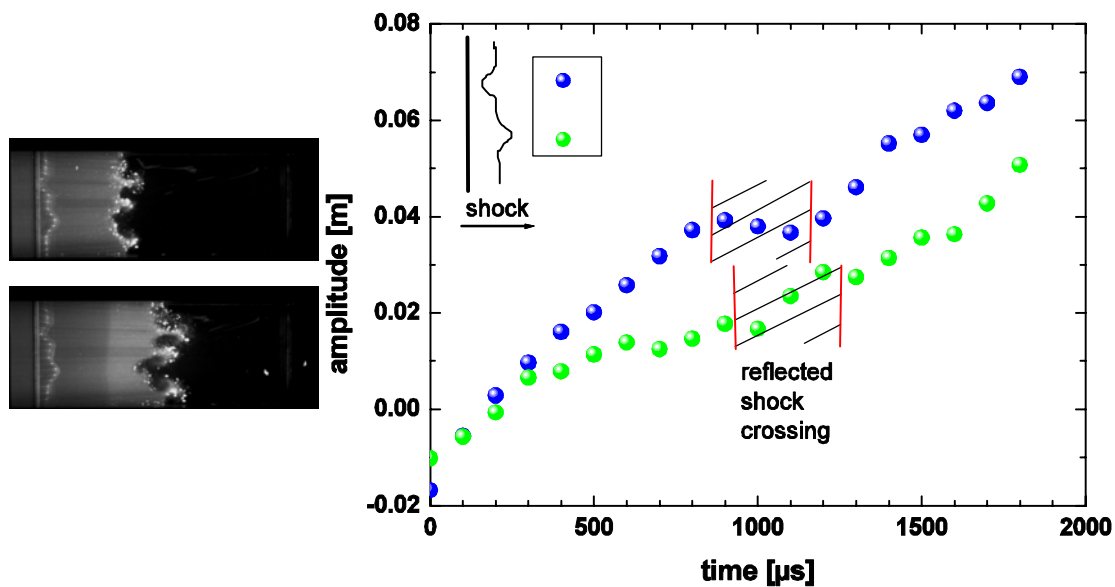


Figure 1: Example of laser sheet typical visualisations of a heavy/light (air/helium) interface submitted to a 1.31 incident shock wave Mach number, moving from left to right first in air (grey) then in helium (black). Frame 0 is taken 22  $\mu\text{s}$  before interaction (100  $\mu\text{s}$  separate two consecutive frames, i.e. 700  $\mu\text{s}$  between frames 0 and 7). The amplitudes and wavelengths of the initial perturbations are  $a_0 = 90$  mm and  $\lambda = -18$  mm and  $a_0 = 80$  mm and  $\lambda = 14$  mm, respectively. (b) Evolution of the amplitude of the initial perturbations (the opposite value of the negative perturbation is plotted in order to keep both graphs on the same figure).