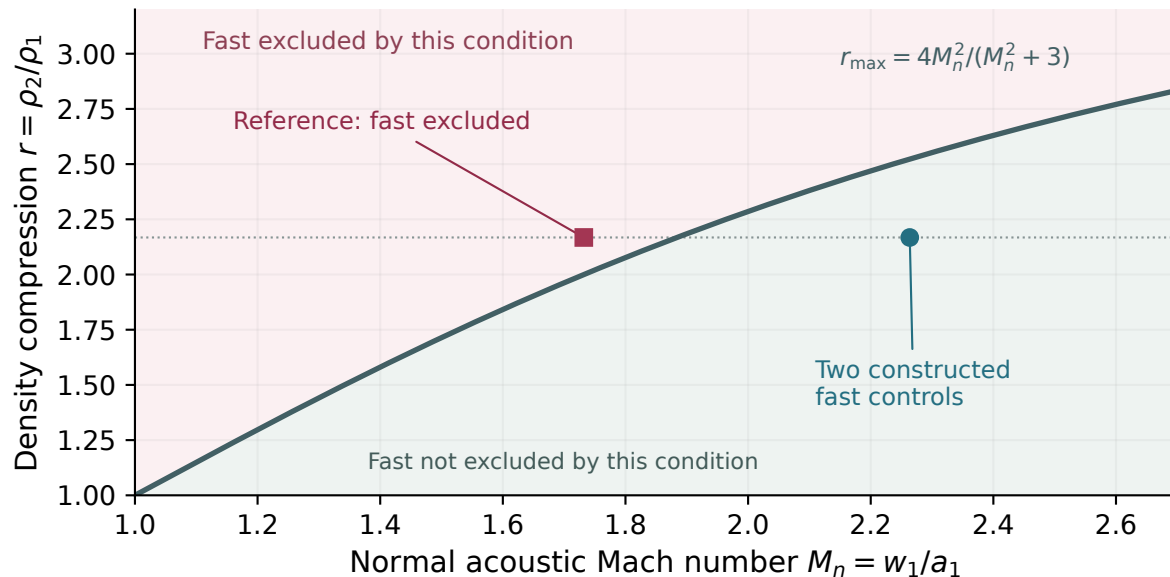


Which missing input leaves a fast alternative?

RMO99 | One R98 reference state | $\gamma = 5/3$ | Magnetic field withheld

(a) A necessary condition for a fast shock



Compression 2.168 exceeds the fast limit 2 at the reference Mach number.

w_1 is plasma flow normal to the front in its rest frame; $a_1^2 = \gamma p_1/\rho_1$. Table: normalized units, $\rho_1 = 1$.

One planar ideal-MHD test with exact inputs. Fast exclusion does not identify slow uniquely; solar errors and other alternatives remain open.

(b) Same compression, different information

Flow + thermal constraint known

Fast excluded

$w_1 = 0.8660$, $p_1 = 0.1500$

Normal flow unknown

A fast state exists

$p_1 = 0.1500$; $w_1 = 1.1318$

Thermal constraint unknown

A fast state exists

$w_1 = 0.8660$; $p_1 = 0.08782$