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Who Does Control the Attack Transients of the Recorder, the Musician or the Instrument Maker?

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Who controls the attack transients of recorder?



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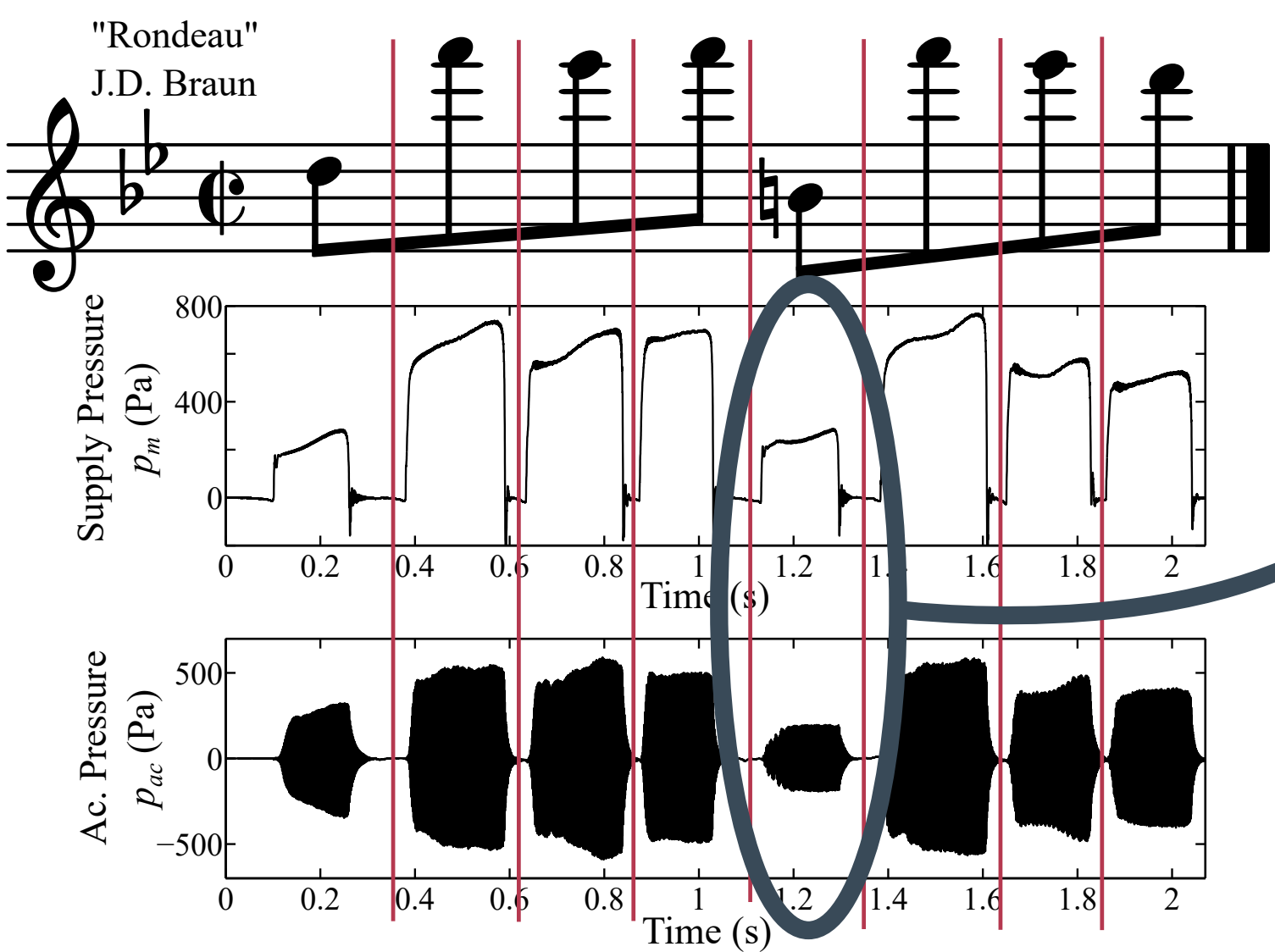
Acquisition of musical attacks

4 equipped recorders (Bass, Alto, Soprano, Sopranino)

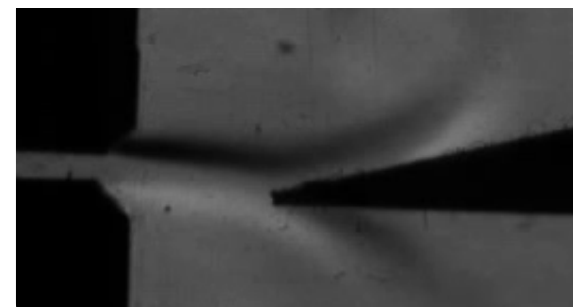
3 players:

- Expert 1 (4 recorders: 2800 notes)
- Expert 2 (Alto & Soprano: 900 notes)
- Novice (Alto & Soprano: 600 notes)

Tasks: Scales & Music

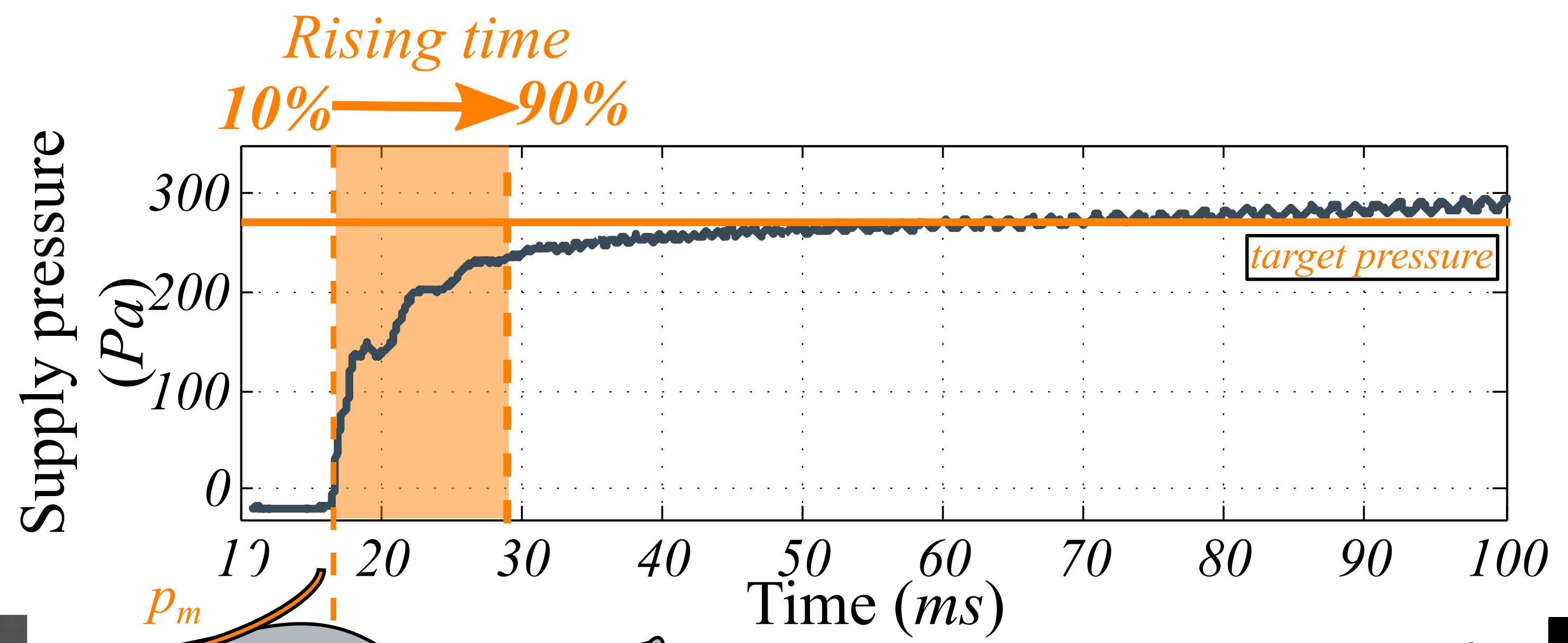


No blow

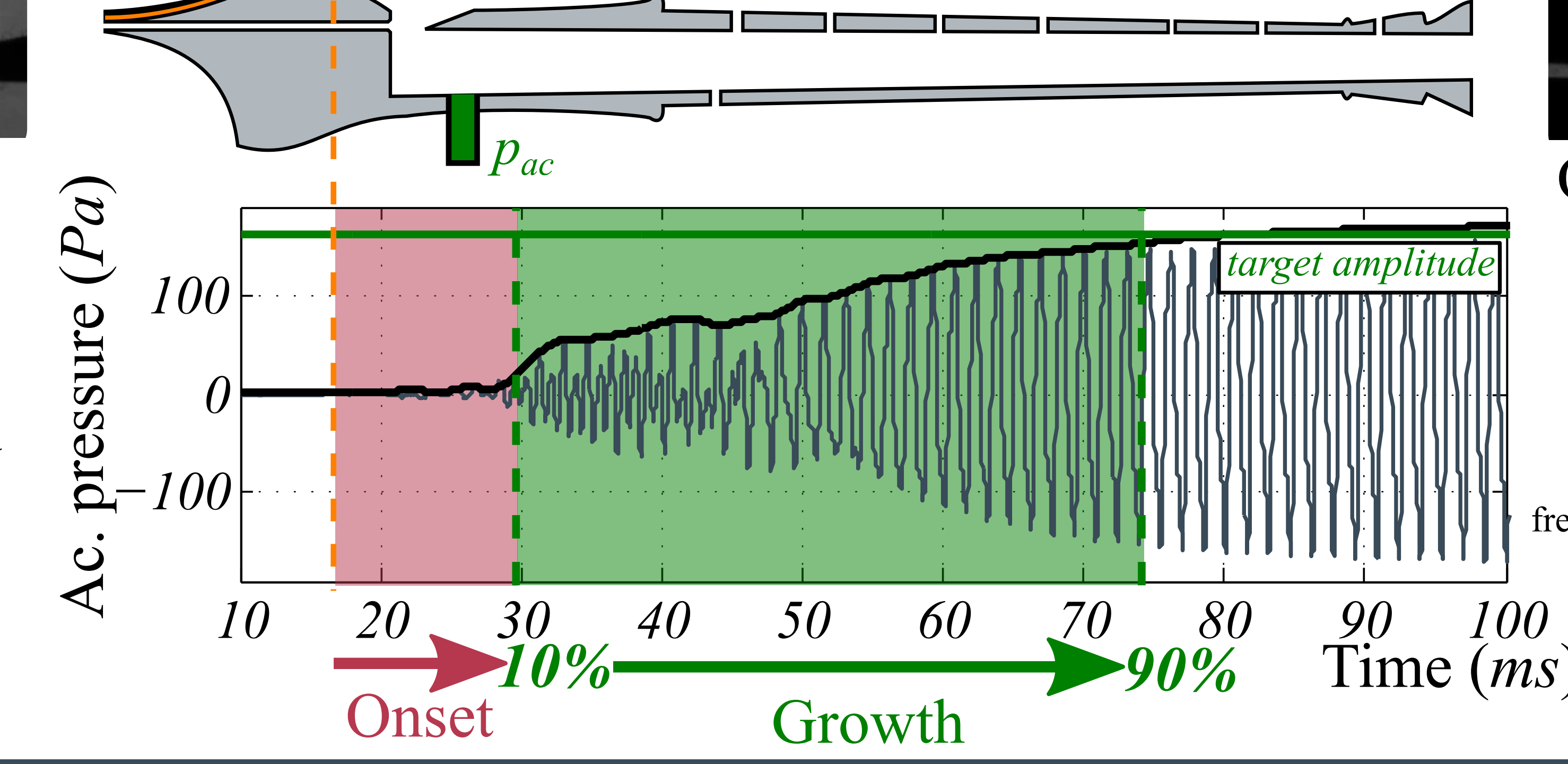


No Jet

No sound



Steady Pressure

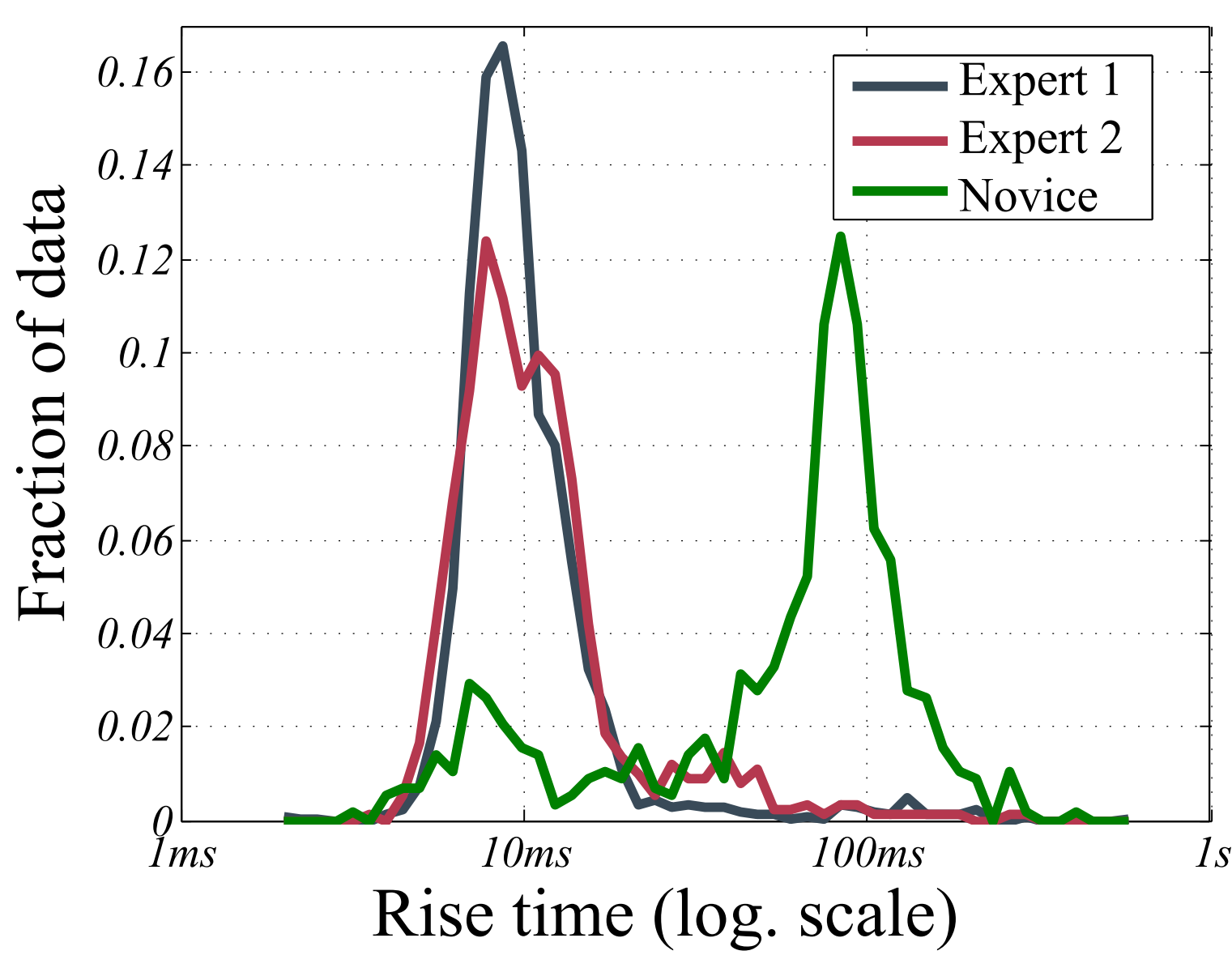


Oscillating Jet

Steady Sound: frequency, amplitude

Air supply

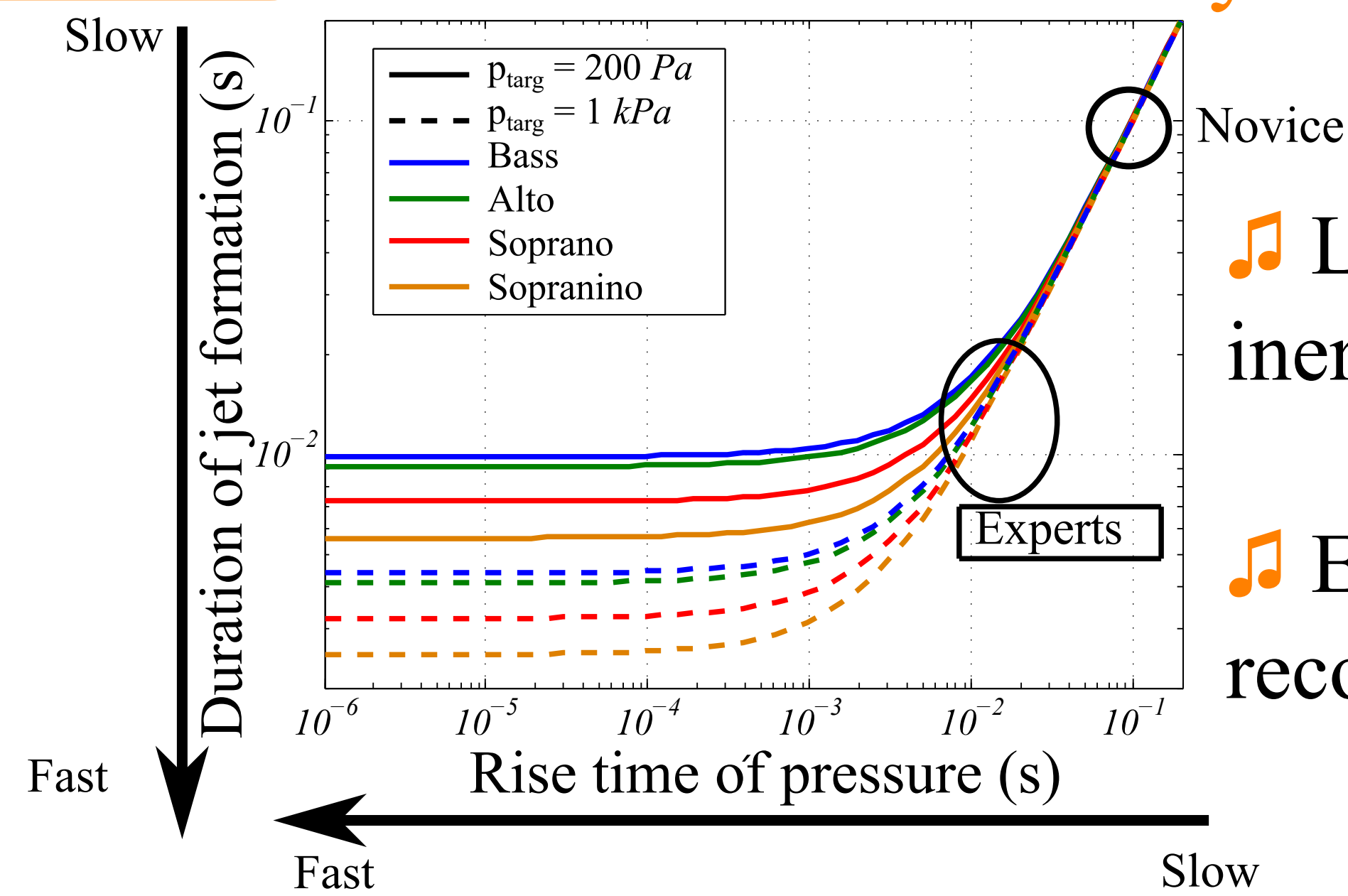
Pressure



- Independent of:
 - Tessiture
 - Instrument
 - Target pressure
- 2 experts: similare
- Novice = 10 x Experts

Musician: control the pressure rise

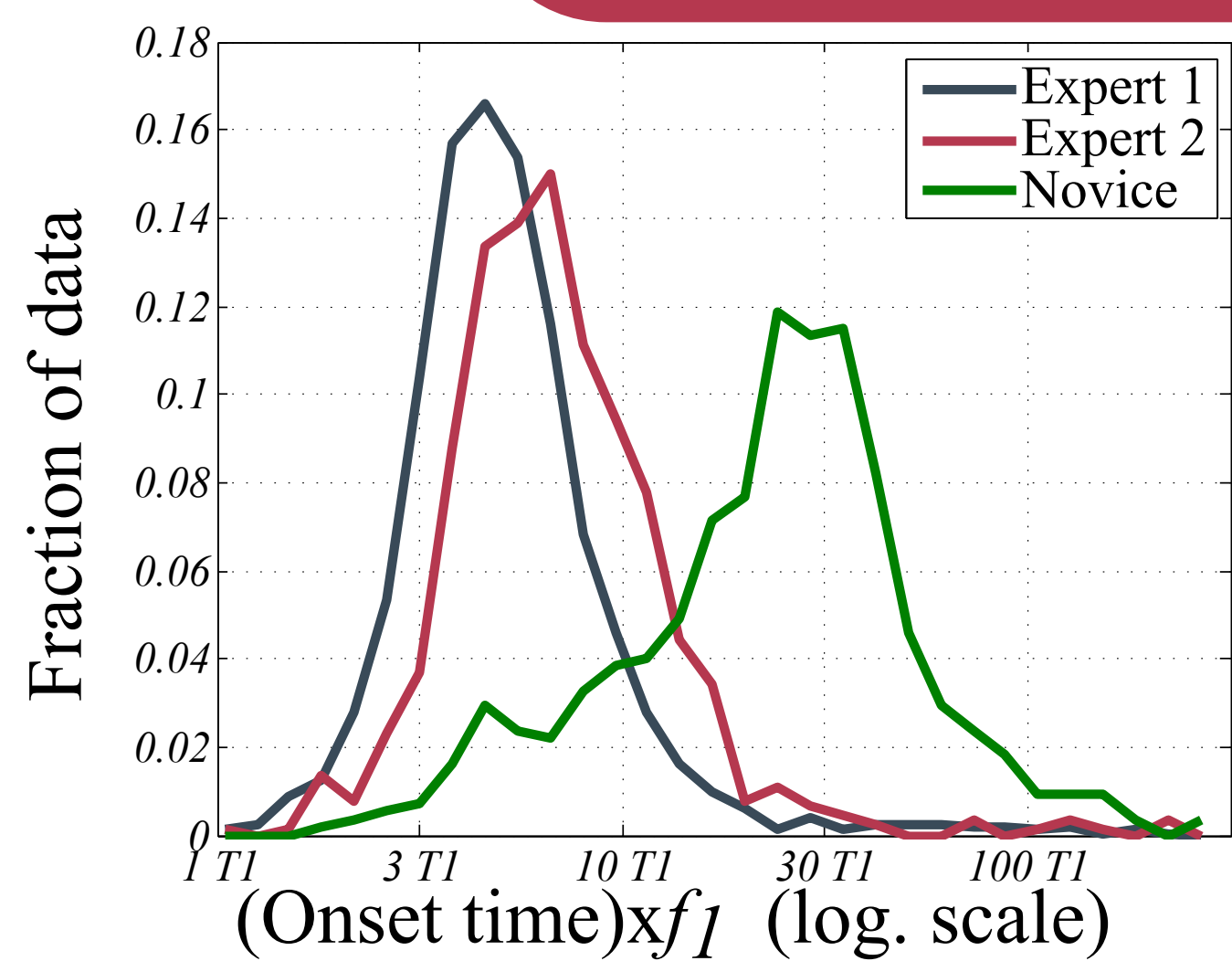
Jet velocity



- Limited by the channel inertia
- Experts: reach the recorders' boundary

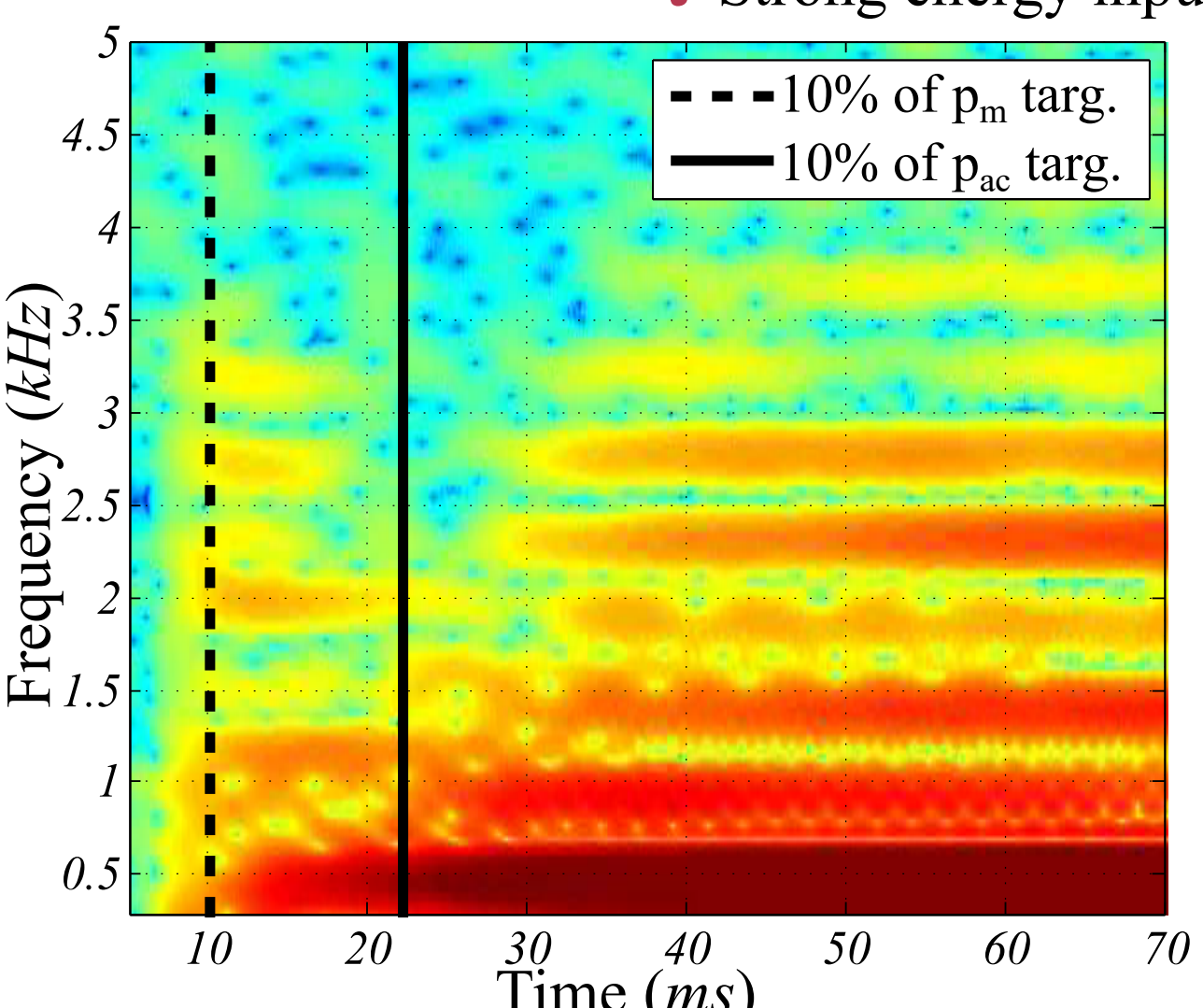
Manufacturer: control the channel inertia

Onset of Oscillation

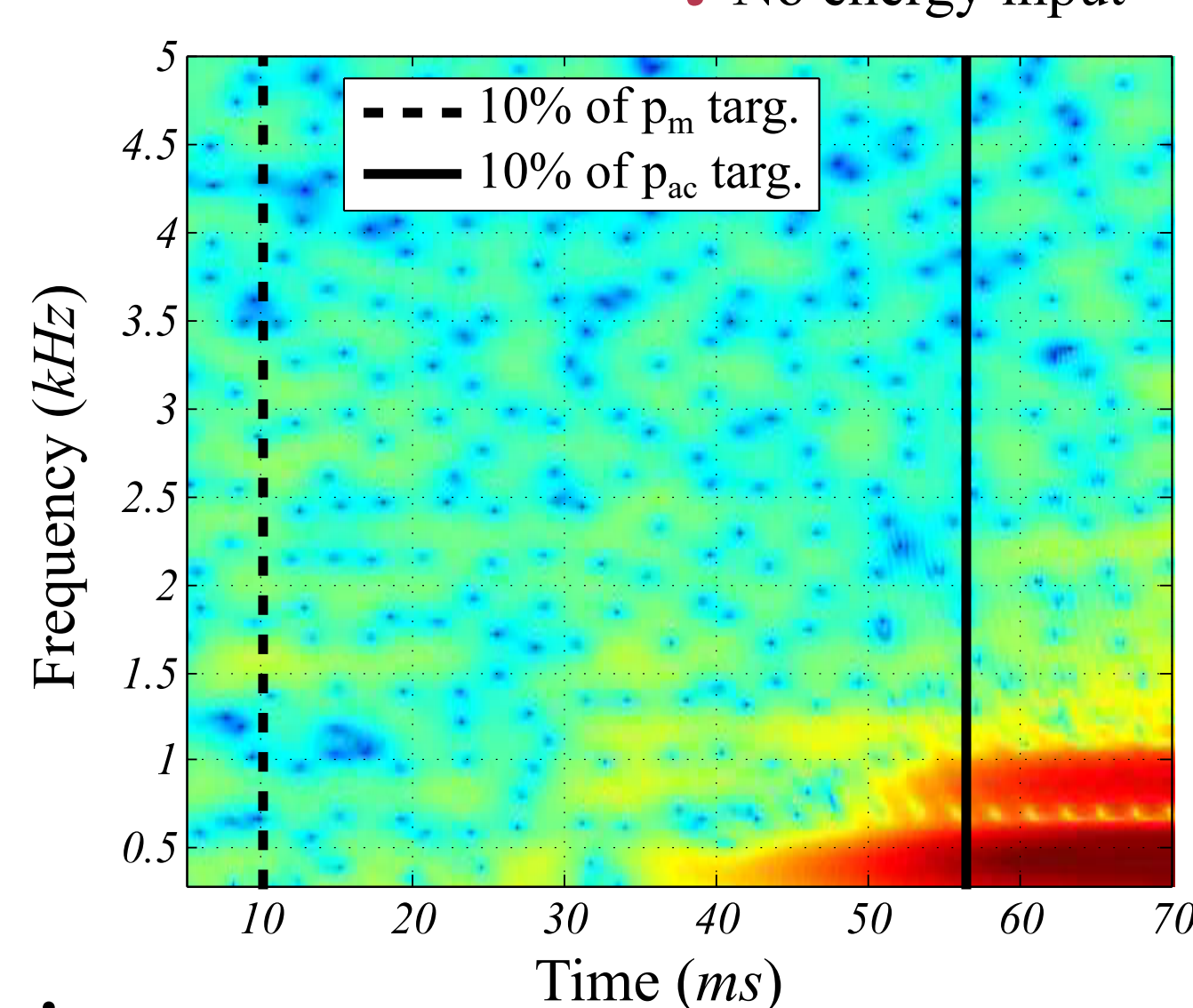


- Duration:
 - Proportional to the period (T_1)
 - Novice = 10 x Experts
 - 2 experts: slightly different

Hard Attacks: Fast pressure rise, Strong energy input



Soft Attacks: Slow pressure rise, No energy input



Musician: energy input

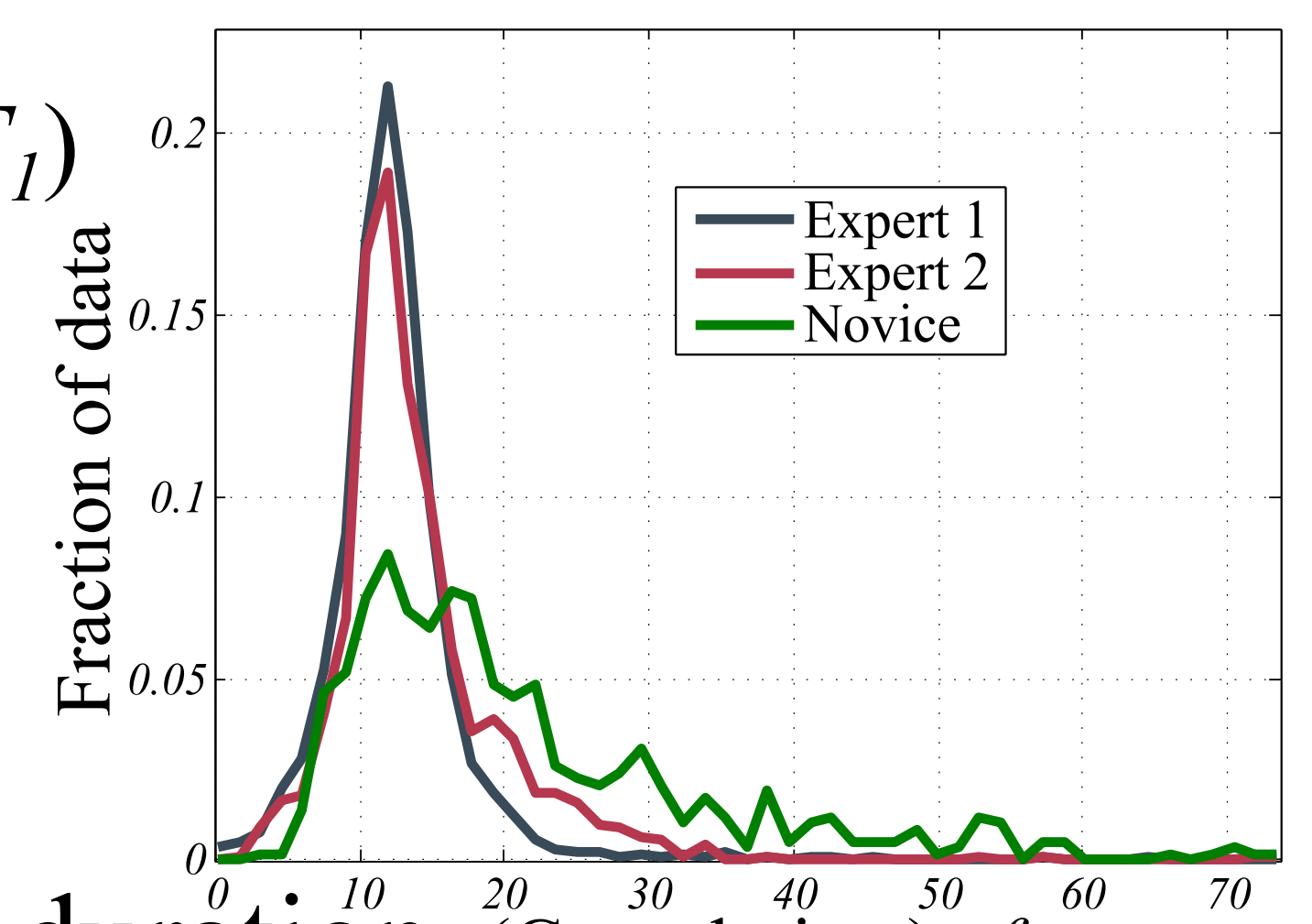
Manufacturer: recorder's response

Growth of Oscillation

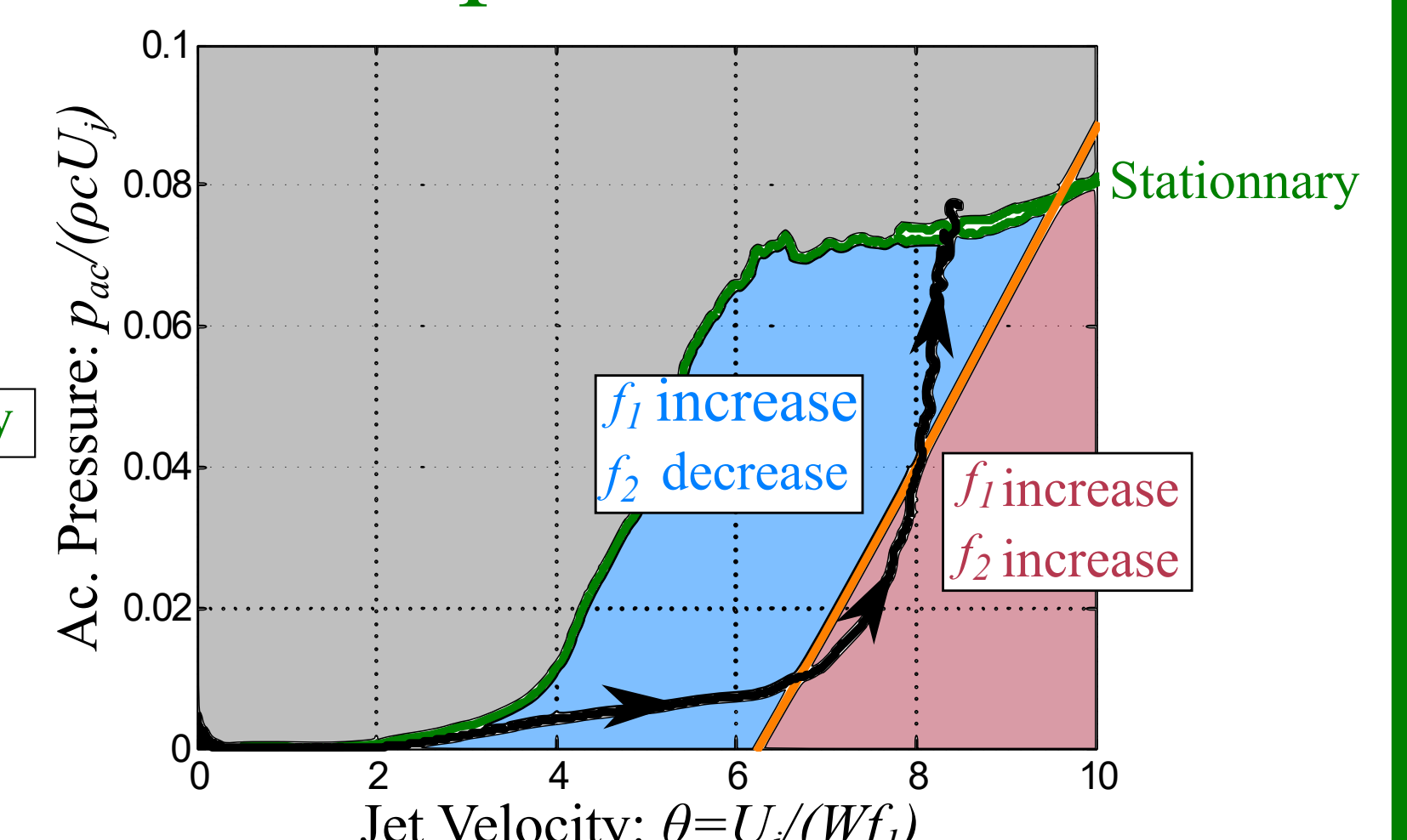
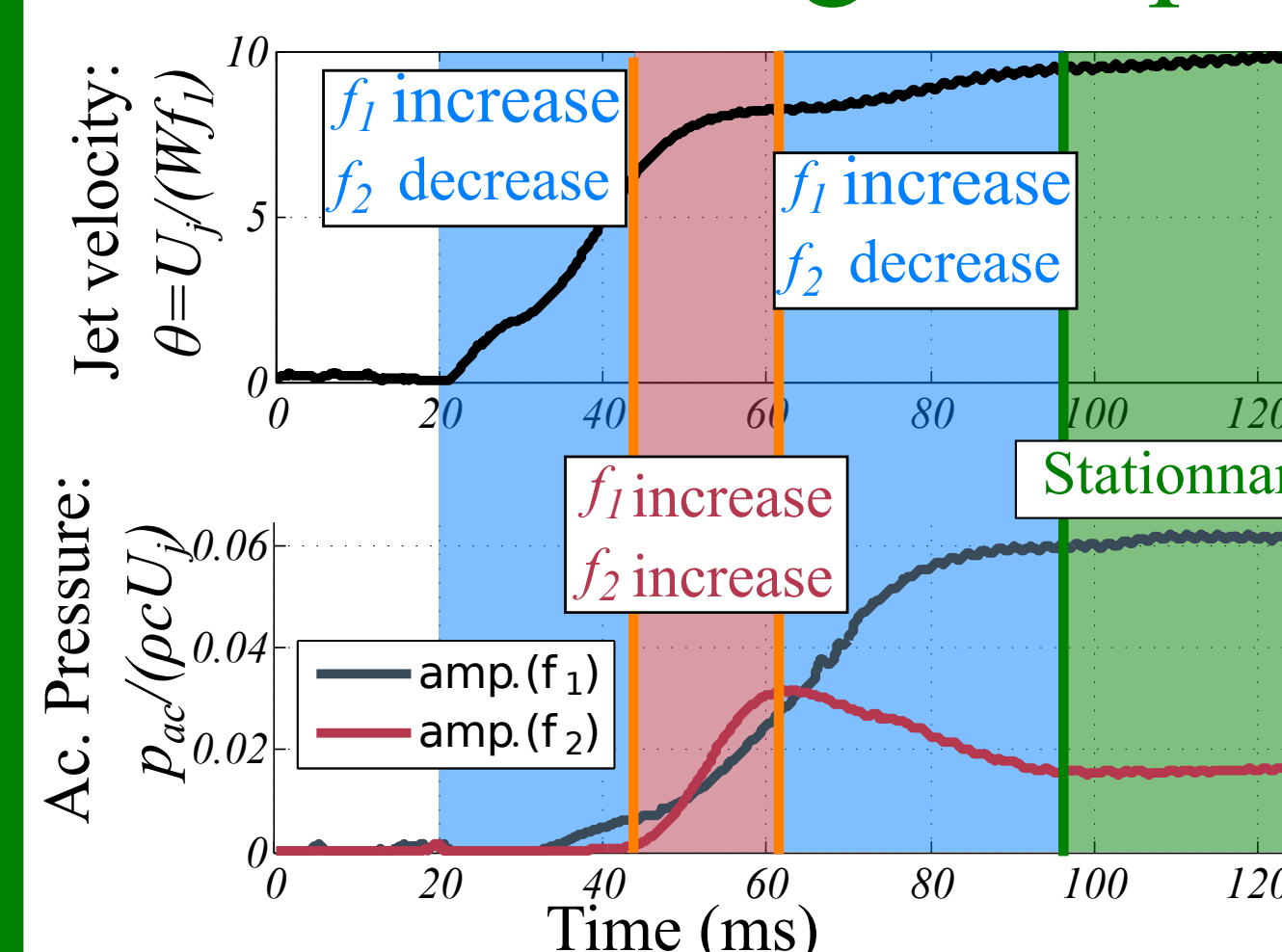
- Duration:
 - Proportional to the period (T_1)
 - (Time/ T_1): Independent of:
 - Instrument
 - Tessiture
 - Player

Musician: low control

Manufacturer: impose the duration (Growth time) x f_1



High frequencies components



Musician: trajectory in the "bifurcation diagram"

Manufacturer: zones of growth