

Flame-Sound Interaction

The Singing Flame



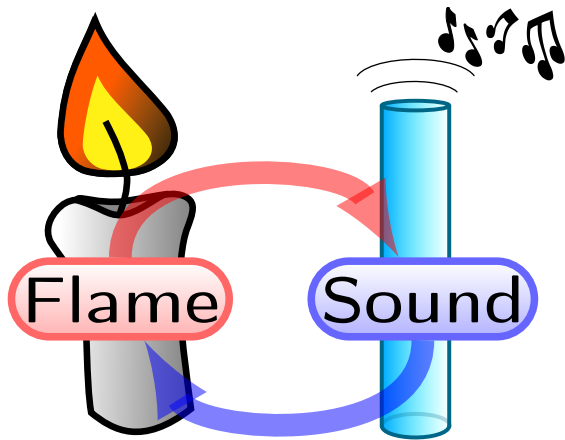
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Sound generation by heat release



Sound in a tube

Flame response to sound

Dancing on: Shakira, Waka Waka



Flame in Tube

Feedback loop:

1. Flame releases sound
2. Air in tube starts to resonate
3. Flame responds to acoustics

Thermoacoustic instability:

If the feedback is positive, high amplitudes can be reached. The flame is singing!

Quiz question

What is the function of the tube in the demonstrated singing flame setup?

- A- Suction of burnt gases by the chimney effect**
- B- Impose a certain sound field by its geometry**
- C- Isolating the system from external sound/noise**