

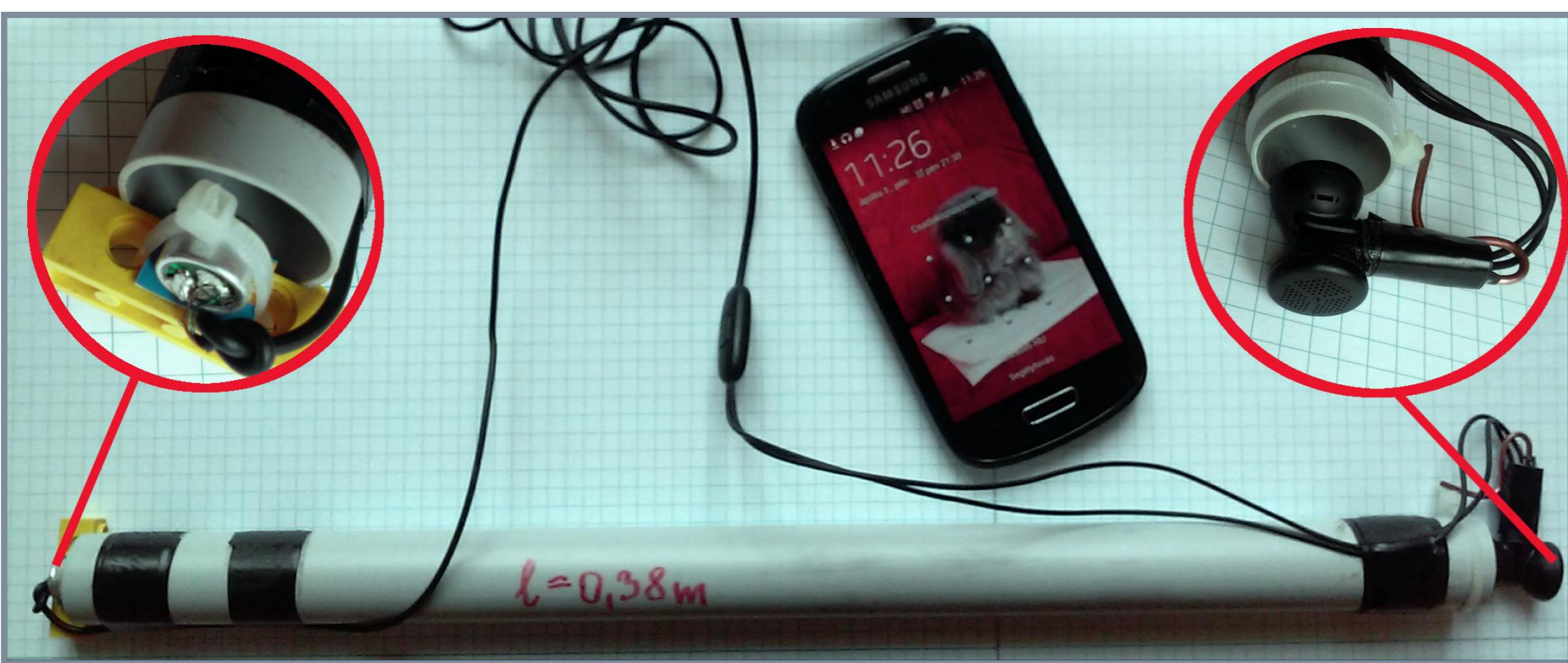


Fanni Vitkóczy | ELTE Trefort Ágoston Practice Grammar | Budapest | Hungary

## Interference in the world of sounds

### Measuring the speed of sound in a tube with smartphone

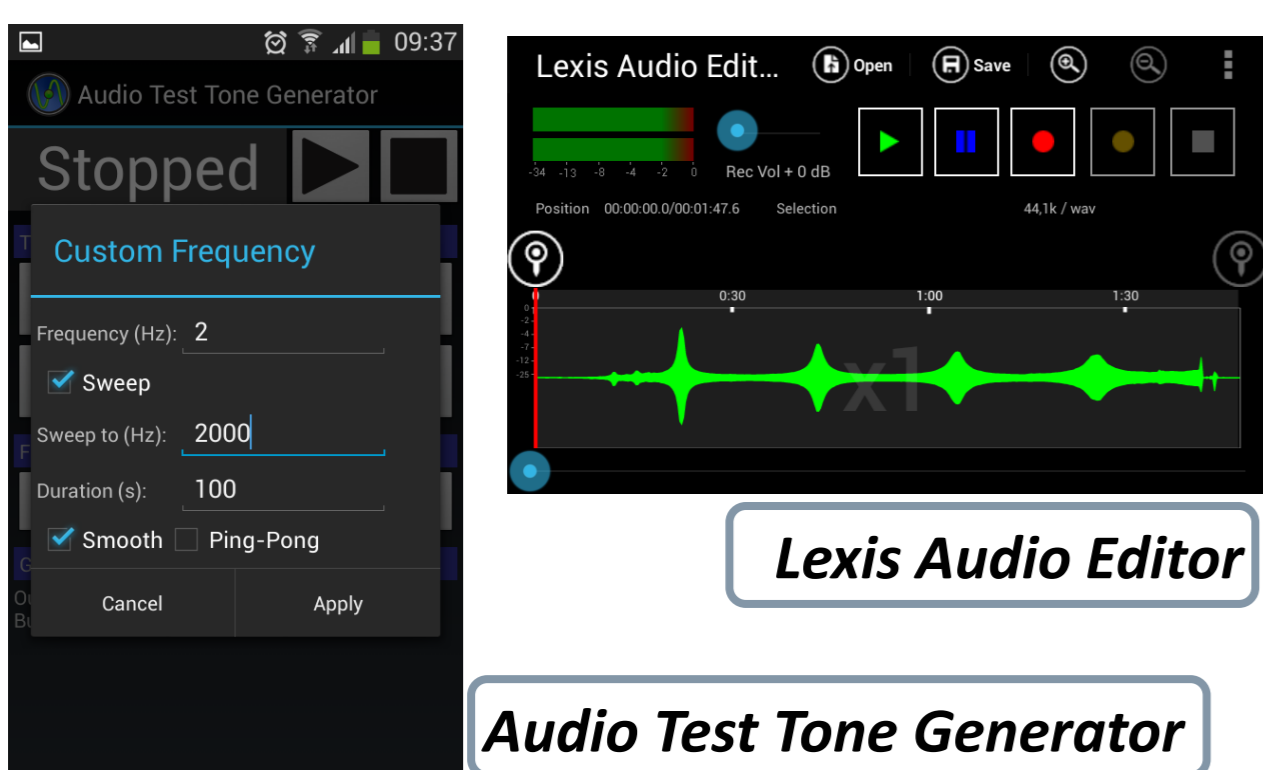
Measurement tools: A plastic tube, a headset and a smartphone



Sound generated by the smartphone with a rising frequency passes through the tube. The signal of the microphone is also recorded using the phone.

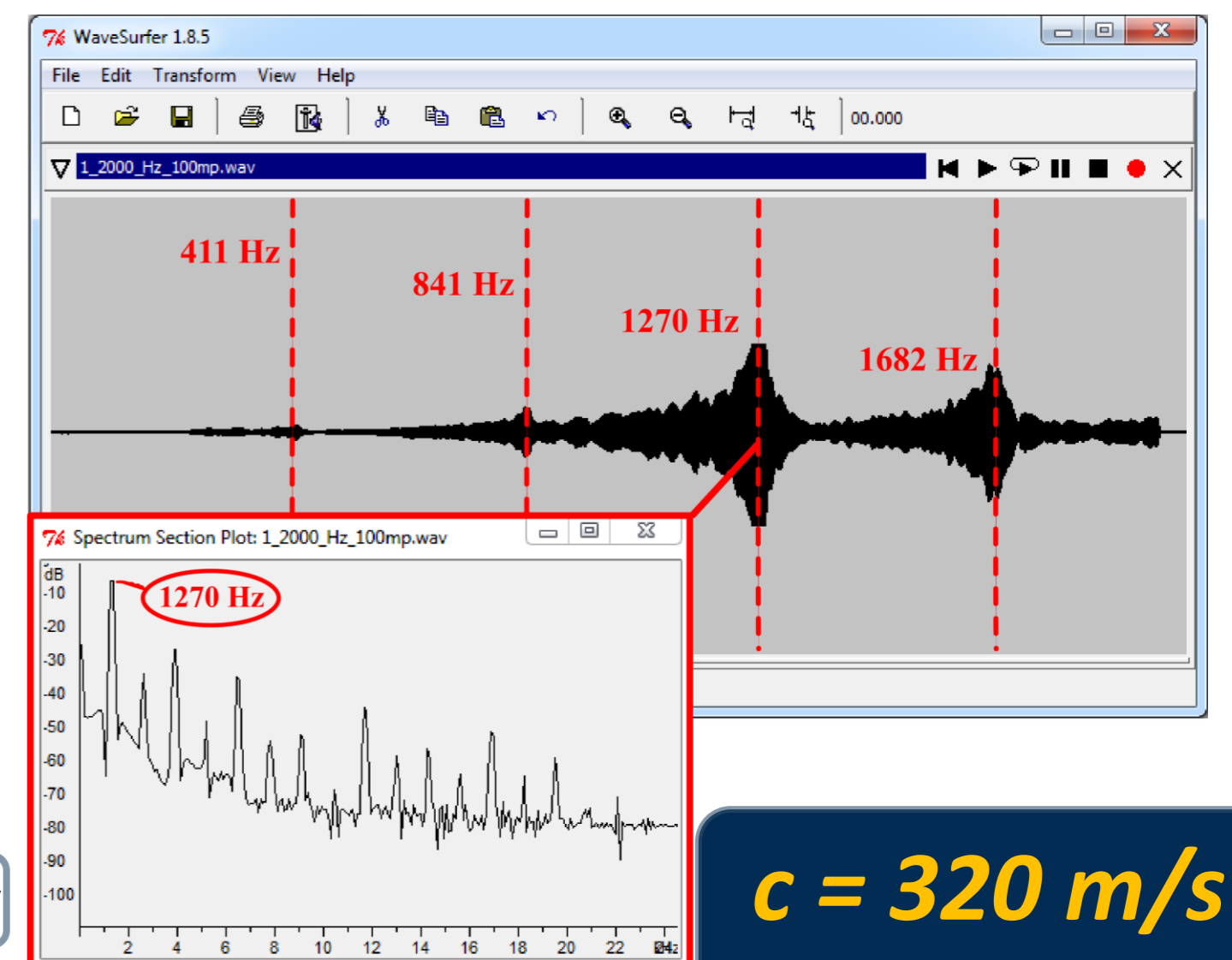
Studying the recorded file, the change in the amplitude can be observed both visually and is also audibly (see below).

### Generating and recording sounds using a smartphone



### Evaluation

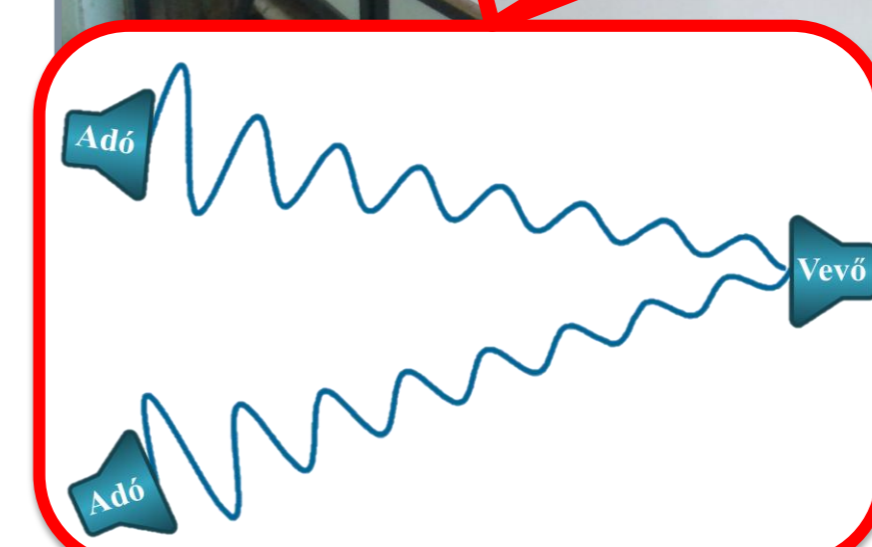
An FFT analysis can provide more accurate results. The free program *WaveSurfer* can be used for such a purpose.



$c = 320 \text{ m/s}$

### Measuring the speed of sound using interference

A headset was connected to the smartphone, with one of the earphones and the microphone fixed at the same place. A sound signal of constant frequency was generated using the app *Audio Test Tone Generator*. Then, the other earphone was moved slowly towards the fixed one and the microphone. The half-wavelength of the sound could be determined using the distance of the adjacent positions of the maximal amplifications and attenuations. Knowing the frequency and the wavelength, the speed of sound could be calculated.



$c = 354 \text{ m/s}$