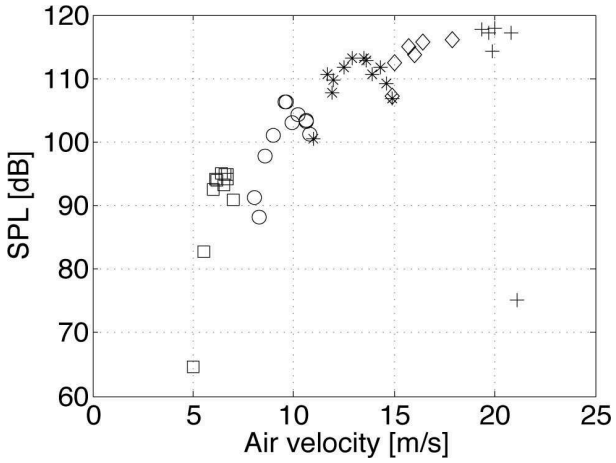

Figure 2: Sound pressure levels of dominant frequencies measured at 30mm position as function of flow velocity.

3 Results

3.1 Flow generated resonances

In figure 2 are shown the resonances generated by letting the vacuum cleaner draw air through the pipe. The sound pressure level of the dominant peak (measured 30mm into the pipe from the air entry end) is plotted against the velocity measured at the box end of the pipe by the Pitot tube, U_{pt}. The fundamental longitudinal resonance could not be excited. By increasing the velocity, harmonics were found at 506 (square), 751(circle), 1012(star), 1256(diamond), and 1517(plus) Hz.

3.2 Resonances generated by 10Hz oscillation alone

It was also observed that with no air flow drawn through the system, the 10Hz oscillation could by itself excite resonances in the corrugated tube. Figure 3 shows the different dominant peaks as function of $L_{10}(30)$, the 10Hz sound pressure level measured 30mm from the flow entry opening. Figure 4 shows the spectrum at a $L_{10}(30)$ level of 107.6dB. We see that the peak is rather broad and modulated by the 10Hz tone.

In what follows, we chose to represent the oscillating field by a sound pressure level value at a given position, namely the $L_{10}(30)$ value.

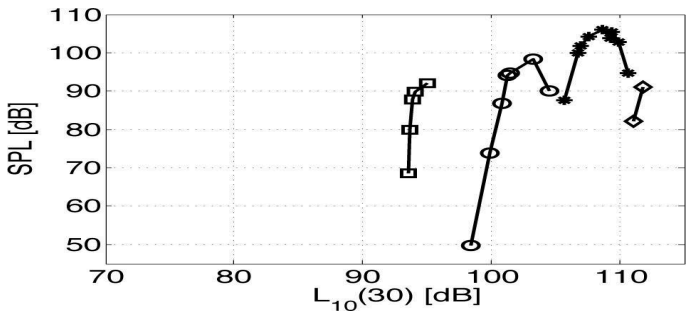

Figure 3: Resonances generated by 10Hz tone alone.