For the complicated pitch perception example given in a paper by De Cheveigné the corresponding and resulting sound energy frequency spectrum can be calculated by combining all the contributions with an identical frequency in the harmonic complex. This is shown in this figure.

Again, because our auditory sense appreciates the 1/ f criterion for tone contributions in the sound pressure tone complex P_0 , this is chosen as a constraint in Fig. a.

After differentiation, this results in a perilymph velocity frequency spectrum v_0 inside the scala tympani and scala vestibuli for all frequency contributions in equal perilymph velocity amplitudes, as shown in Fig. b. We also apply the harmonic contributions in such a manner that they all have zero phase differences.

Hence, all contributions in P_0 are purely sinusoidal and zero at time $t = 0$. The calculation of all primary and combination frequencies – sum and difference frequencies in this example – finally offers the resulting sound energy frequency spectrum S_f, given in Fig. c. We can also see in Fig. c that the smallest distance Δf between successive harmonics, present eight times in the frequency spectrum, is equal to the fundamental f_0 .