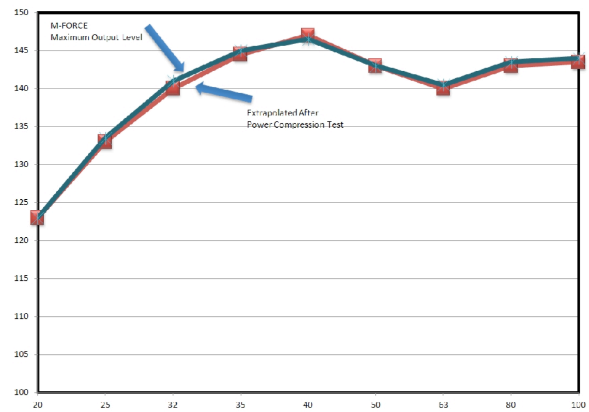

Figure 19 – Maximum Output Level of the moving magnet transducer with extrapolated power compression data

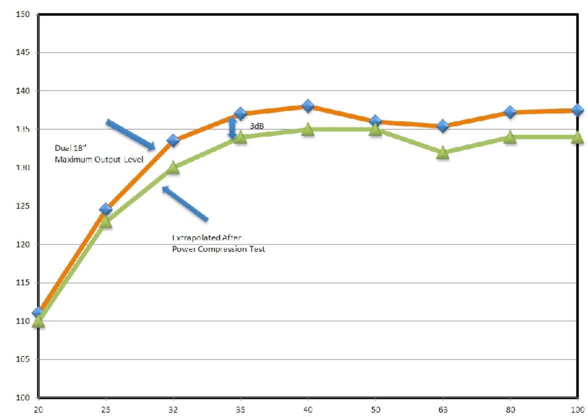

Figure 20 – Maximum output level of the dual 18" subwoofer with extrapolated power compression data.

As it can be clearly seen from the figure 20, the power compression effect into a conventional moving coil speaker is already very evident after some minutes. Then, if we estimate overall maximum output level we should necessarily take into account that after few minutes, the output level coming from the moving coil transducer will be quickly reduced of an amount that could be also in excess of 3dB. In figure 21 there is the most important comparison and it takes place between the moving coil subwoofer and the dual 18" subwoofer. The two curves are extrapolated from the data after the power compression test. This comparison reveal that the output difference between the subwoofer based on moving magnet attached to a 30" cone it can be up to 12dB of more output if compared to the conventional dual 18" design after the power compression takes place. So, in addition to the higher efficiency and the capability of easily manipulating transducer behavior with the complex impedance compensation, considering these last measurements, this could be another clear advantage of the moving magnet design over a conventional moving coil.

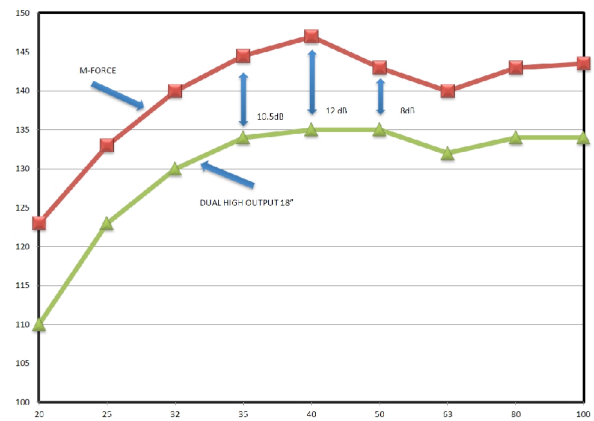

Figure 21 – Final comparison of MOL with calculated power compression effects for the moving magnet transducer and the dual 18" subwoofer.

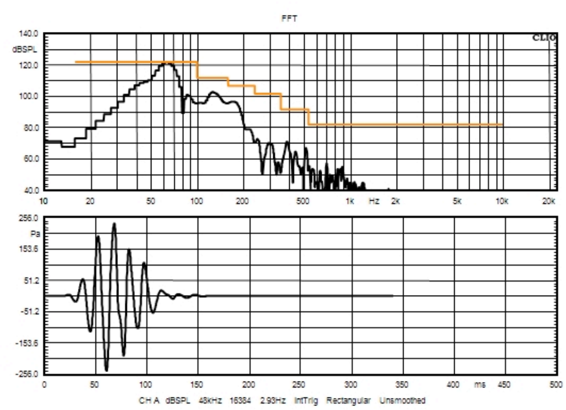

Figure 22 – An example of ANSI/CEA maximum output level measurement in one frequency point.

In figure 22 it is possible to see an example of measurement at one frequency point using the ANSI/CEA standard method.

9. CONCLUSIONS AND FURTHER DEVELOPMENTS

The novel moving magnet transducer offers very interesting fields of application. Even though not mentioned in this paper, some of those could be found also outside of the audio field. Anyway, regarding the professional audio subwoofer applications, in this paper it has been shown a suggested approach to subwoofer design using very high motor strength transducers that is not based onto flatness of the acoustic output but is based on MOL and box dimensions optimization. Of course this approach is clearly based onto the availability of a specific DSP assisted amplifier, specifically designed and optimized to drive very high motor strength transducers. Few simple applications have been shown here in order to clarify the use and the advantages but the practical experience that comes from these examples suggests that other results, even more outstanding that these, can be achieved if this new transducer is used in designs that feature much higher acoustic loadin. So, further developments of this work will certainly be in a deep investigation of the use of this transducer in horn design and in other high demanding acoustic loading, where the use of amplifier output parameters and differential pressure feedback control could certainly be even more interesting.

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