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Subject: Re: 4pi measurement

Posted by [Wayne Parham](#) on Fri, 25 Sep 2026 18:00:13 GMT

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Our four Pi model loudspeaker has an on-axis curve similar to yours but maybe with a little less amplitude swing. So for example, from 500Hz to 1.5kHz, there's about a 2dB rise. Then from 1.5kHz to 2kHz, it drops about 3dB and stays there throughout the rest of the audio band.

The on-axis rise between 500Hz and 1.5kHz is entirely due to narrowing beamwidth of the midwoofer, which is also why there is a fairly rapid drop right above that - the output transitions to a constant directivity waveguide/horn device in our current loudspeaker models. Beamwidth in the horizontal is pretty much matched at 1.5kHz, but the midwoofer has more vertical output. At the very lowest range, the waveguide/horn has limited vertical control but it quickly gains it and all that is what causes the on-axis response to move around. Power response is pretty flat, but directivity is shifting a little bit.

Anyway, when comparing with your graph, it does appear that your loudspeaker has a little more on-axis "oomph" above 1.2kHz or so. One thing I like is the output between 800Hz and 1.2kHz is good, which tells me your 2226H is in good shape.

You use a different horn than we do, and that may be the whole reason for the difference in on-axis amplitude response. I don't recall how much more output the older Eminence H290 horn had down low, but it was definitely a different animal. Not much - slightly - but different. It's a pretty decent response curve, but its directivity (and therefore its response) is definitely different.

Beyond that, it sure doesn't hurt to double-check your crossover. First thing - Make sure your Zobel is connected properly. Missing Zobel's often cause a peak around the crossover frequency. Beyond that, check the values of L2, L3 and C4. Double check the values of R3 and C5, again, the Zobel.

Also check the off-axis curves. See what the response looks like at 20 degrees off-axis in the horizontal. You should see fairly close to the same curve above 1.5kHz, but output will be slightly less. Also check around 40 degrees in the horizontal. You will see a little less in the top end. The midwoofer should remain the same volume below 500Hz, but should be less above that. So the peak you see should drop off-axis, more, the further off-axis you go.

Then, just for fun, check the verticals. Ten degrees off-axis should look almost exactly the same but once you get to 20 degrees off, you should find vertical nulls. If you don't see those nulls around 20 degrees, that means the crossover has a hiccup of some sort.

I realize that your loudspeaker is somewhat different than what we now offer - Ours uses a waveguide/horn that provides constant directivity. You said you are using the Eminence H290, which is a radial horn. The Eminence radial horn is pretty good in the horizontals, and the whole loudspeaker with that horn is pretty good. But we switched to an improved flare about 15 years ago. You might consider upgrading to our H290C waveguide/horn because it is a smoother, better performing device.

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