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Geometrical optimization of vented boxes

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Today, low frequency reproduction with loudspeakers in vented box is limited by two factors: the volume of the box, and non-linear airflow through the vent. We propose a novel approach that takes into account aerodynamical parameters, leading to original profiles and an improved functioning of the vented box. For example, under certain alignment conditions, there exists a second cut-off frequency below the first one, localized on the lower impedance hump. Using this lower cut-off frequency and an adapted vent profile makes it possible to radiate frequencies under 40 Hz with box volumes smaller than 1 liter and small drivers. A prototype will be demonstrated.