**On the Design of Some Feedback Circuits for Loudspeakers**

* Transfer functions for loudspeaker performance derived for the cases below, at, and above resonance
* Derivations and assumptions for equivalent and control circuits assume that velocity of cone is measurable, but velocity cannot be directly measured, need to choose one of:
  + Measure current in voice coil and convert using equivalent circuit equations
  + Build bridge around loudspeaker, measure BlV
  + Measure displacement of cone with variable capacitor (author chooses this)
* As cone moves, capacitor value changes, which can be detected by using a certain capacitor from a Clapp oscillator to generate FM signal describing displacement.
* Use phase-locked-loop circuit to demodulate, differentiate demodulated signal to get velocity
* With the used circuits and control, mechanical feedback above 500Hz didn’t work, but below 500Hz the performance was fairly linear

**Design and Evaluation of Accelerometer based Motional Feedback**

**Control of Loudspeakers Using Disturbance-Observer-Type Velocity Estimation**

* Keyword: SENSORLESS
* Estimate back-emf of coil using d-o-t estimator based on coil current, since velocity is proportional to back-emf
* More robust against changes to acoustic loading since you’re measuring an electrical parameter rather than a mechanical parameter
* Accurate measurement without expensive / complicated mechanical system