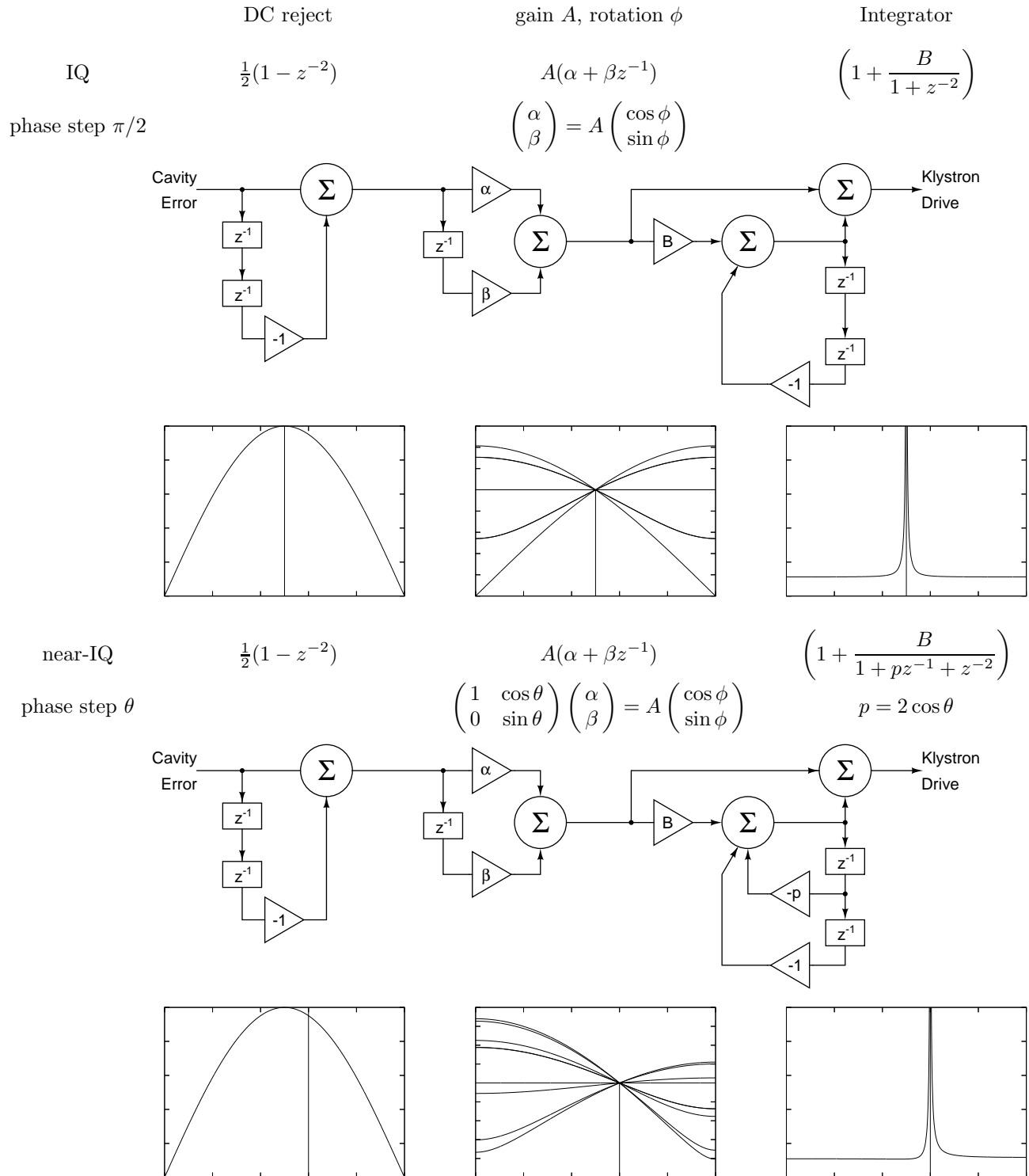


Digital Feedback for Cavity Field Control using Near-IQ Sampling

Larry Doolittle, LBNL, February 2006



Near-IQ sampling should average out most ADC nonlinearities, improving band-limited performance with only minor complications to the low-latency DSP. This simplified picture ignores:

- calibrated summation of multiple cavities
- attempts to compensate for klystron gain compression
- output data rate doubling (optional)
- controlled bandwidth limiting (a.k.a. Kalman filter)
- state-space resonance tracking and tuner control
- additional pipeline steps
- effects of finite word width
- feedforward table(s)
- additional real pole-zero pairs