

Cavity Simulator in FPGA

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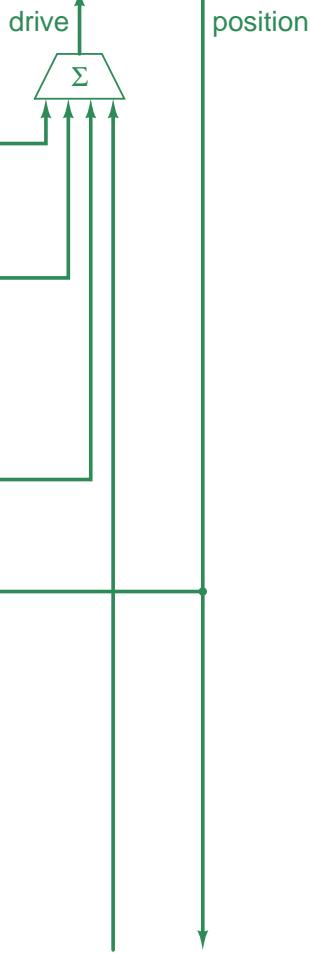
(abridged)

Clocks at ~200 MHz in Xilinx 7Axxx
8 cavity-controller pairs could fit on AC701?

m mechanical modes updated every 2m cycles

Mechanical eigenmode propagator
 $zy = My + d$

resonator.v



Gaussian noise
Environmental sources?

outer
`outer_prod.v`

Piezo control

Virtual Piezo

outer
`outer_prod.v`

Beam timing

Cavity electromagnetics simulator

Electromagnetic eigenmode propagator
(π mode)
`cav_mode.v`

outer
`outer_prod.v`

Electromagnetic eigenmode propagator
($8\pi/9$ mode)
`cav_mode.v`

outer
`outer_prod.v`

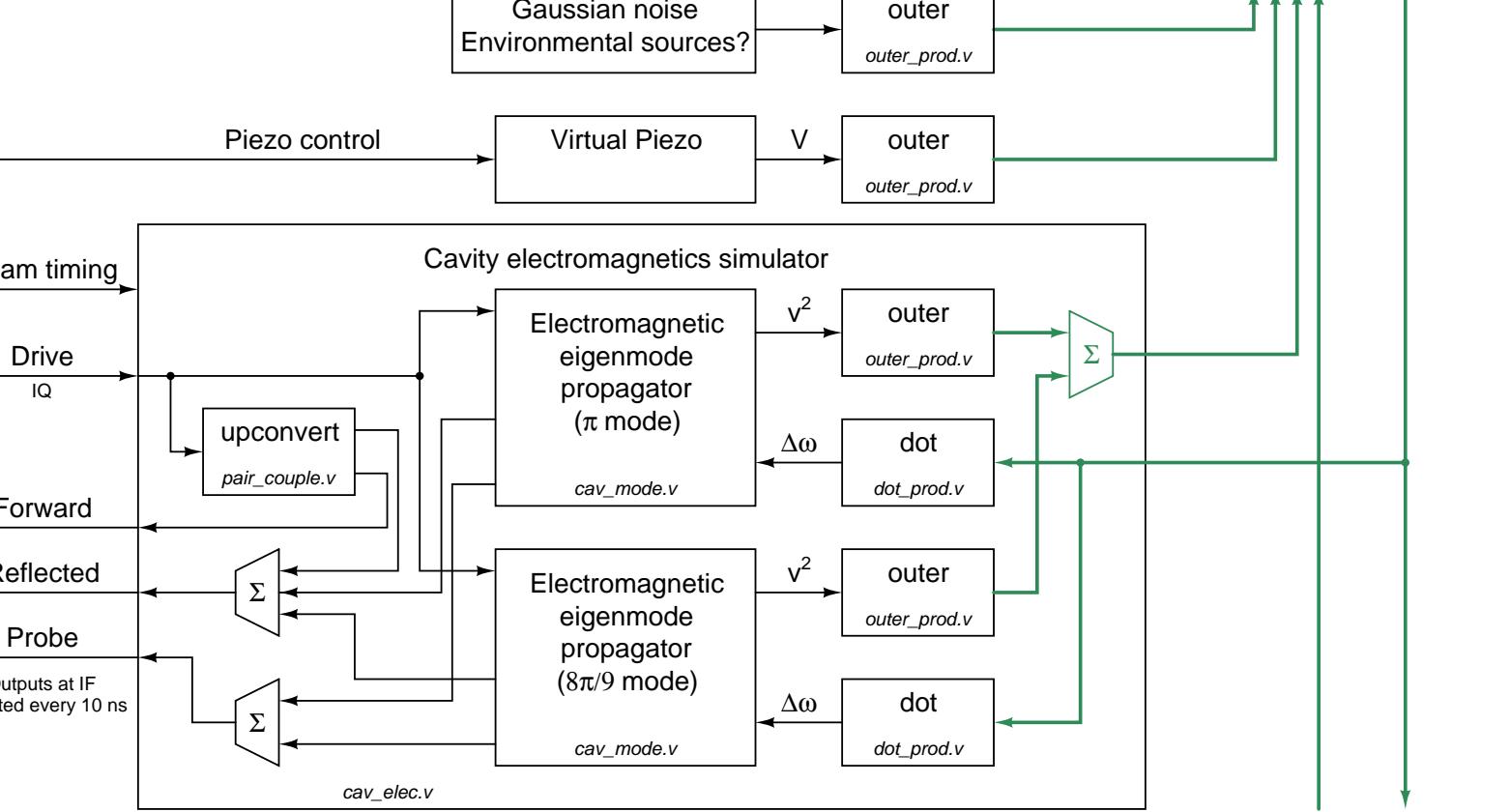
Drive

Forward

Reflected

Probe

Outputs at IF
updated every 10 ns



`cav_elec.v`

to additional cavities