



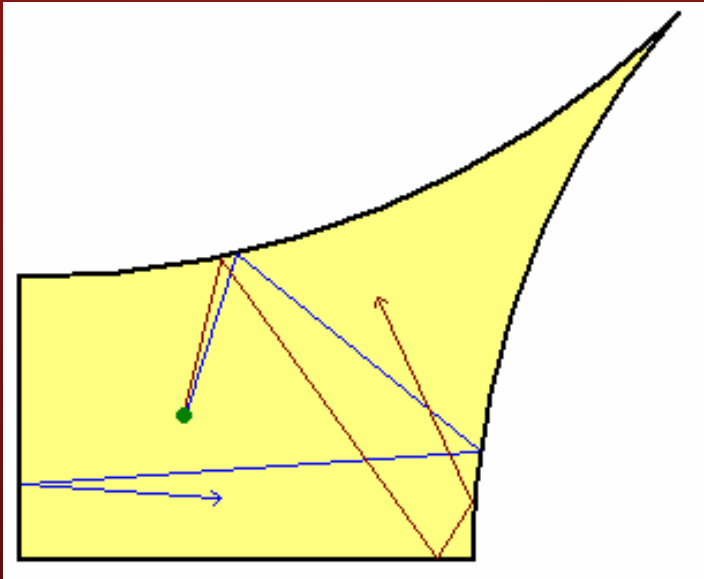
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# Universal Properties of Wave Chaotic Cavities with Significant Port Cross-Talk

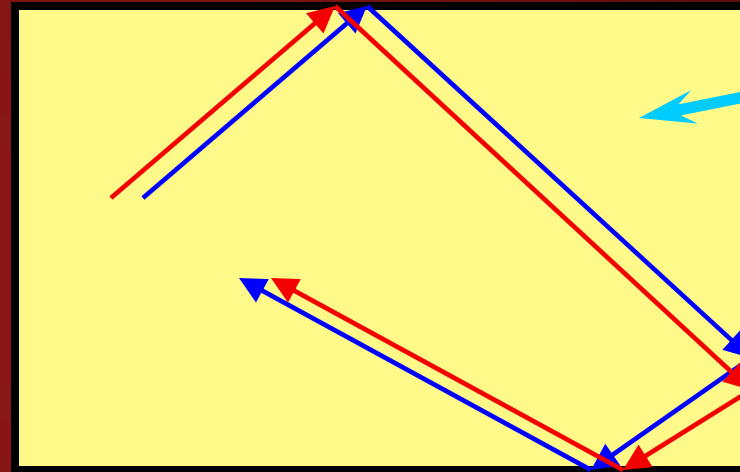
Michael Johnson

Advisors: Edward Ott and Thomas Antonsen

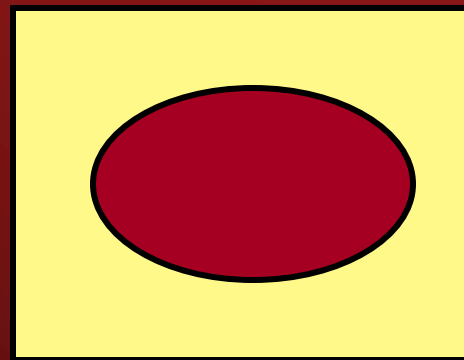
# What is a Wave Chaotic Cavity?



**Exponential  
Sensitivity to Initial  
Conditions**



**Not  
Chaotic**



**Chaos is not  
unusual**

# Statistical Electromagnetism

## Universal Properties

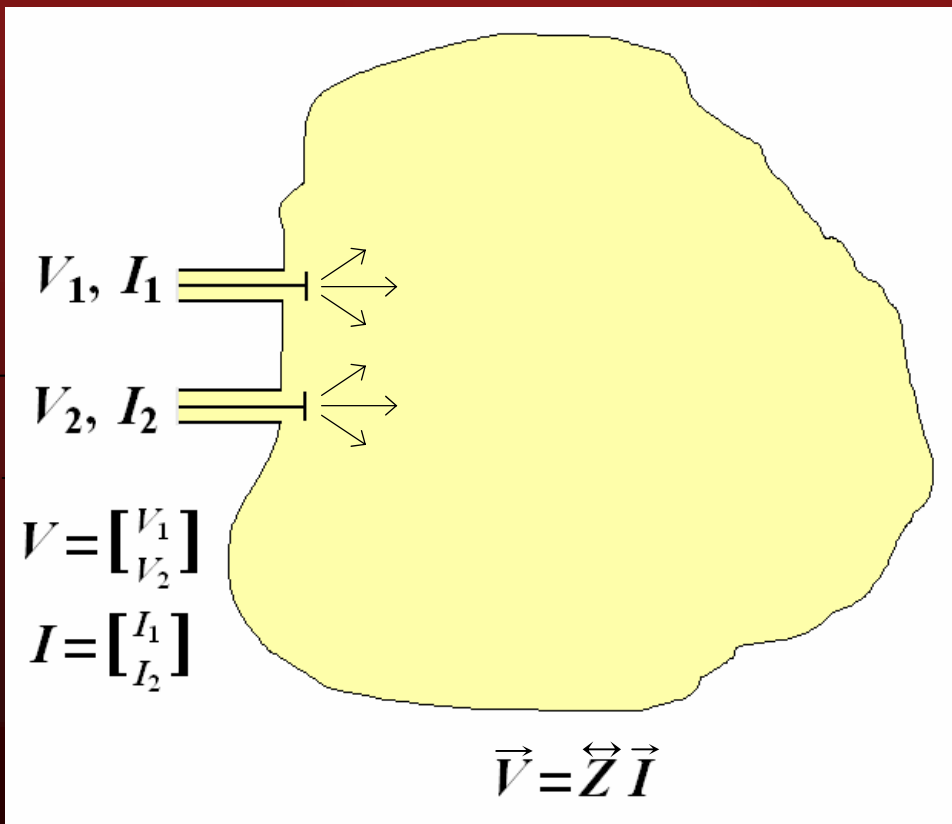
- Apply to all quantum chaotic cavities
- Generally statements about statistical ensembles

## Normalization

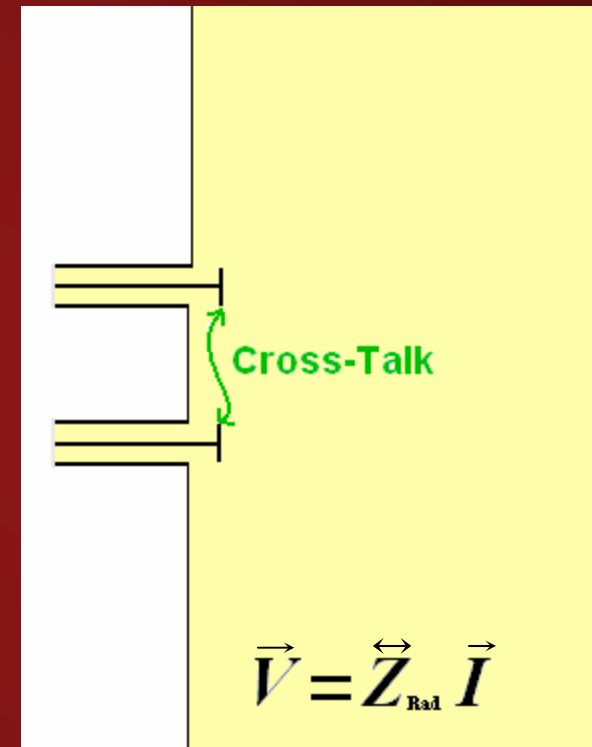
- Systematically quantify effects which are system-specific

# “Radiation Impedance”

$\vec{Z}$  is known to have different statistical properties for different cavities



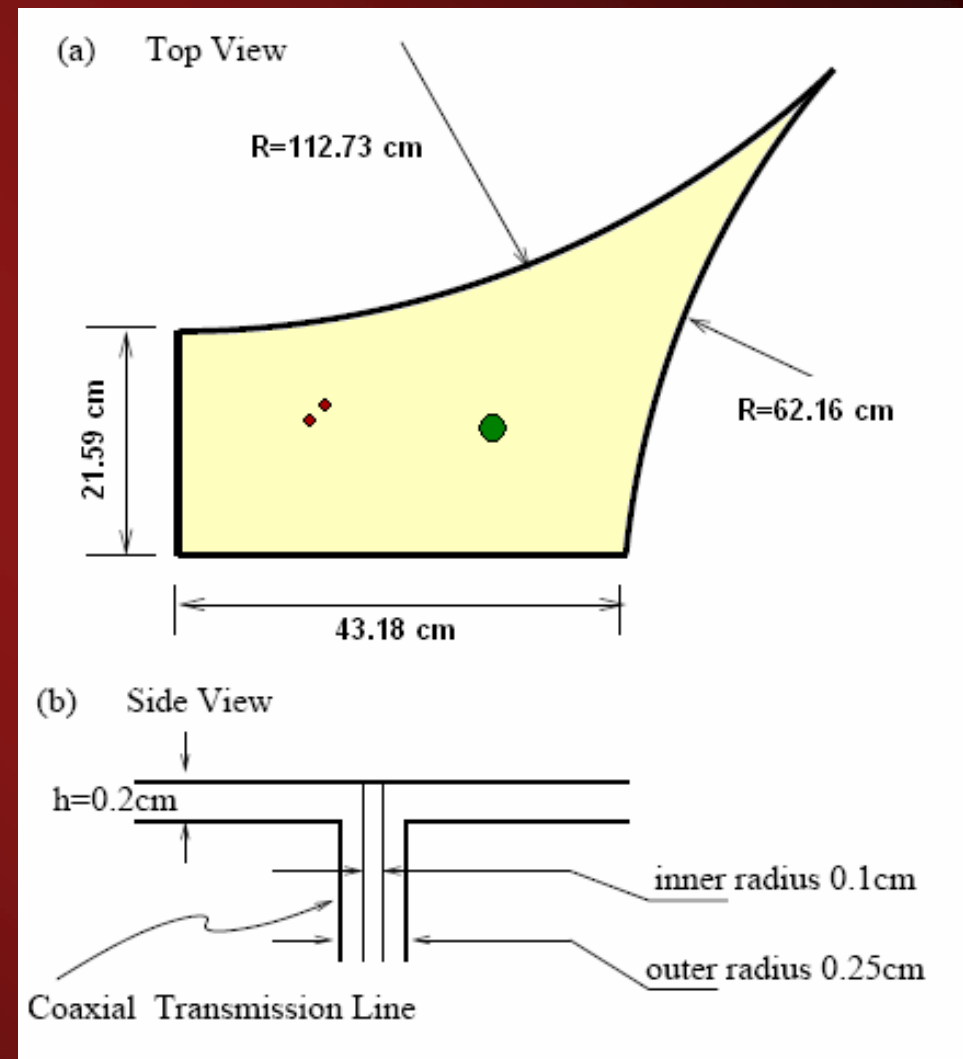
“Radiation Impedance” quantifies system specific variation



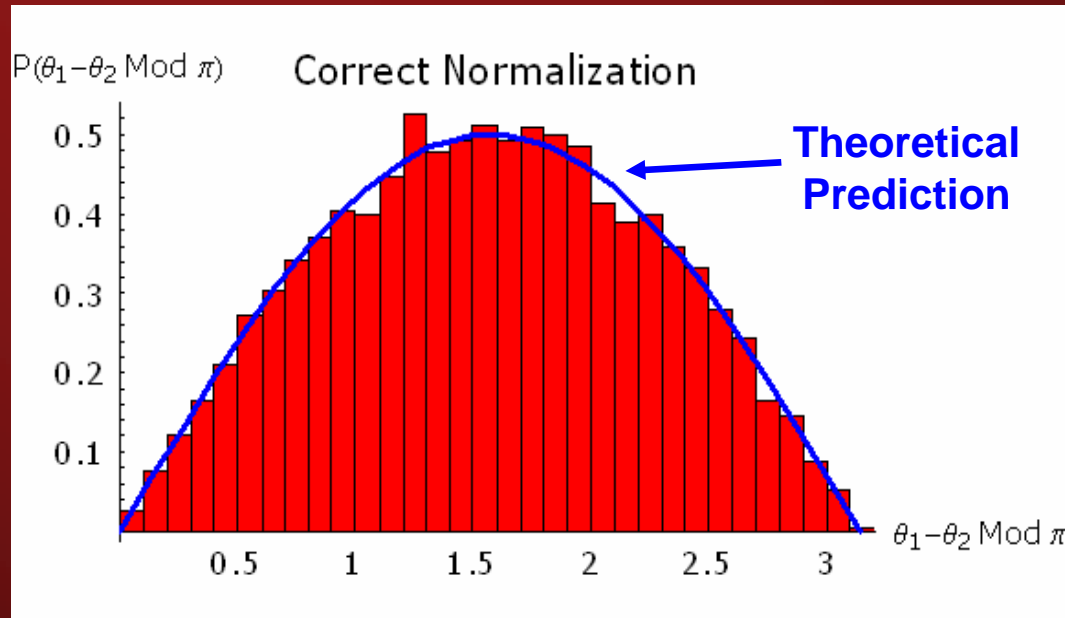
# Numerical Procedure

Statistical Ensemble of Field Solutions Through:

- Frequency Sweep (7.5-8.5 GHz)
- System Geometry Perturbation

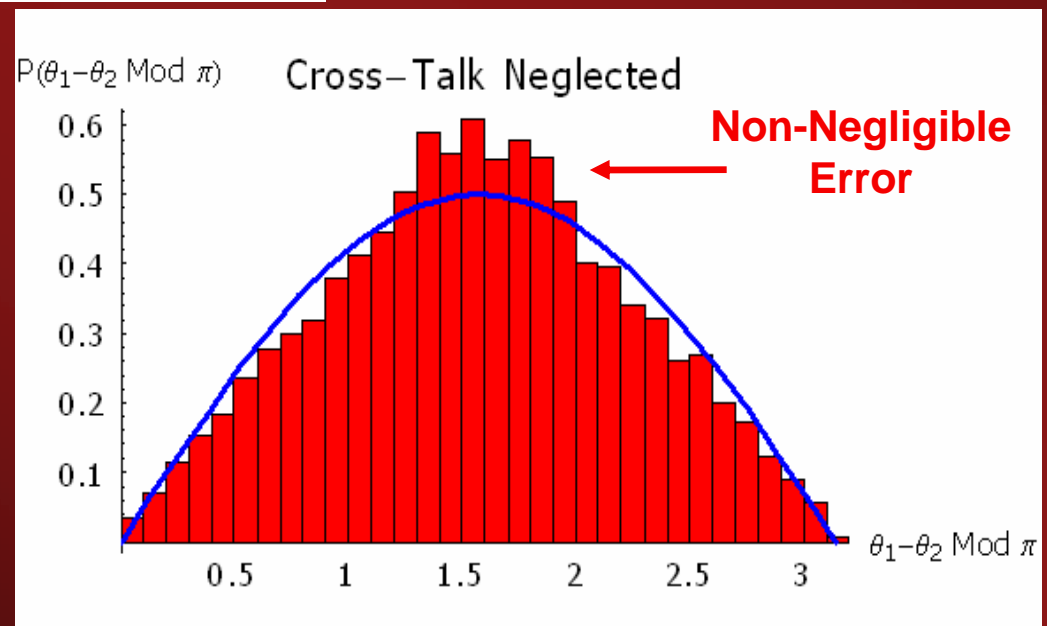


# Example Results



This agreement is generic and independent of system details

Deviation from theory would change with modification of system details



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