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Origin of 125 MHz Oscillations on RITS-6

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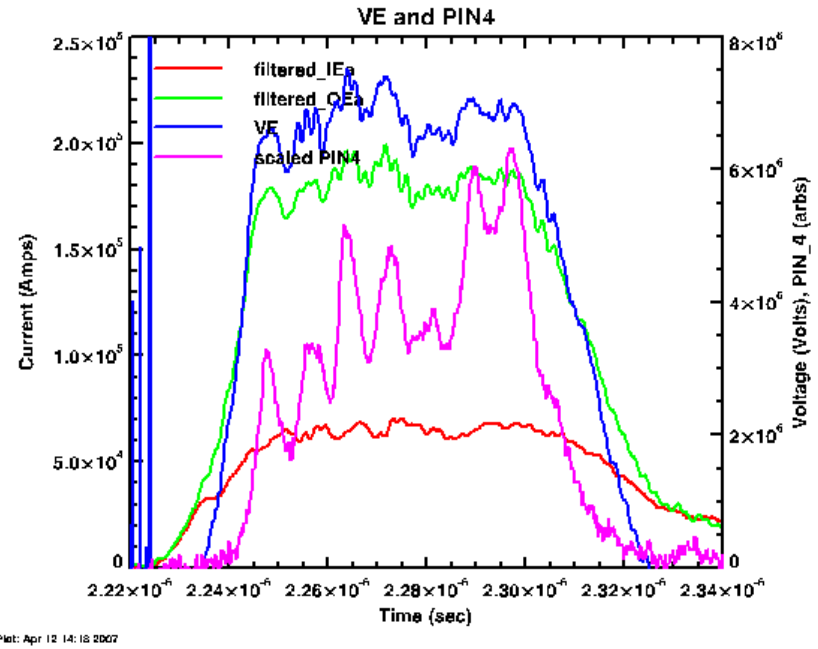
Overview

- To date, radiation pulses for various diodes on high and low-Z RITS-6 exhibit strong amplitude oscillations @ ~ 125 MHz

- Until recently, assumed 125 MHz oscill's were excited in dustbin region

  – Most LSP simulations do not see strong evidence of 125 MHz oscillations for geometries fielded on RITS-6

- **Now, appears that 125 MHz oscill's originate upstream of dustbin, near last cavity (#6) in IVA section**



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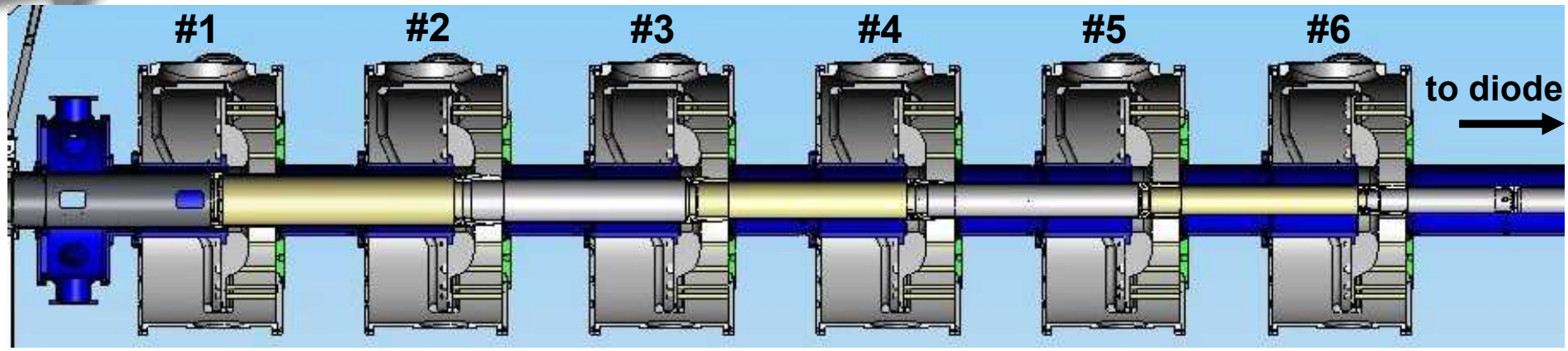
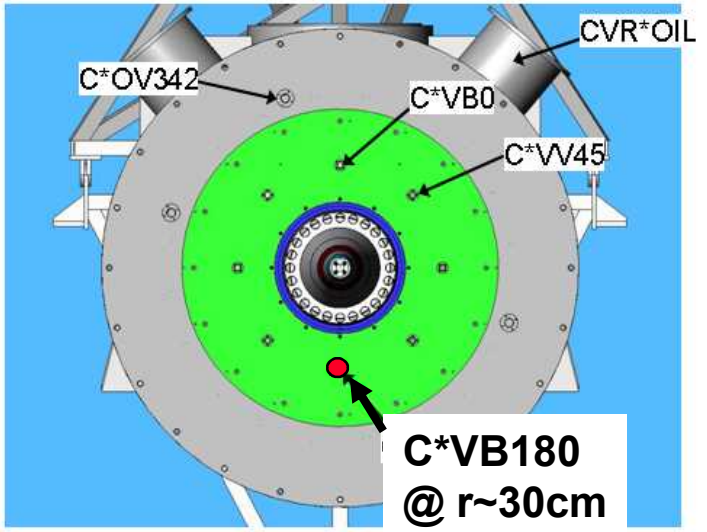
RITS-6 Cavities



130 cm

125 MHz is detected is several locations:

- E, F, and G MITL current monitors in MITL
- Dustbin/Diode region
- **Cavity B-dots** on # 5 and # 6
  (and a little on #4 sometimes)
  - on Low and High Z MITLs
  - with and without Dustbin



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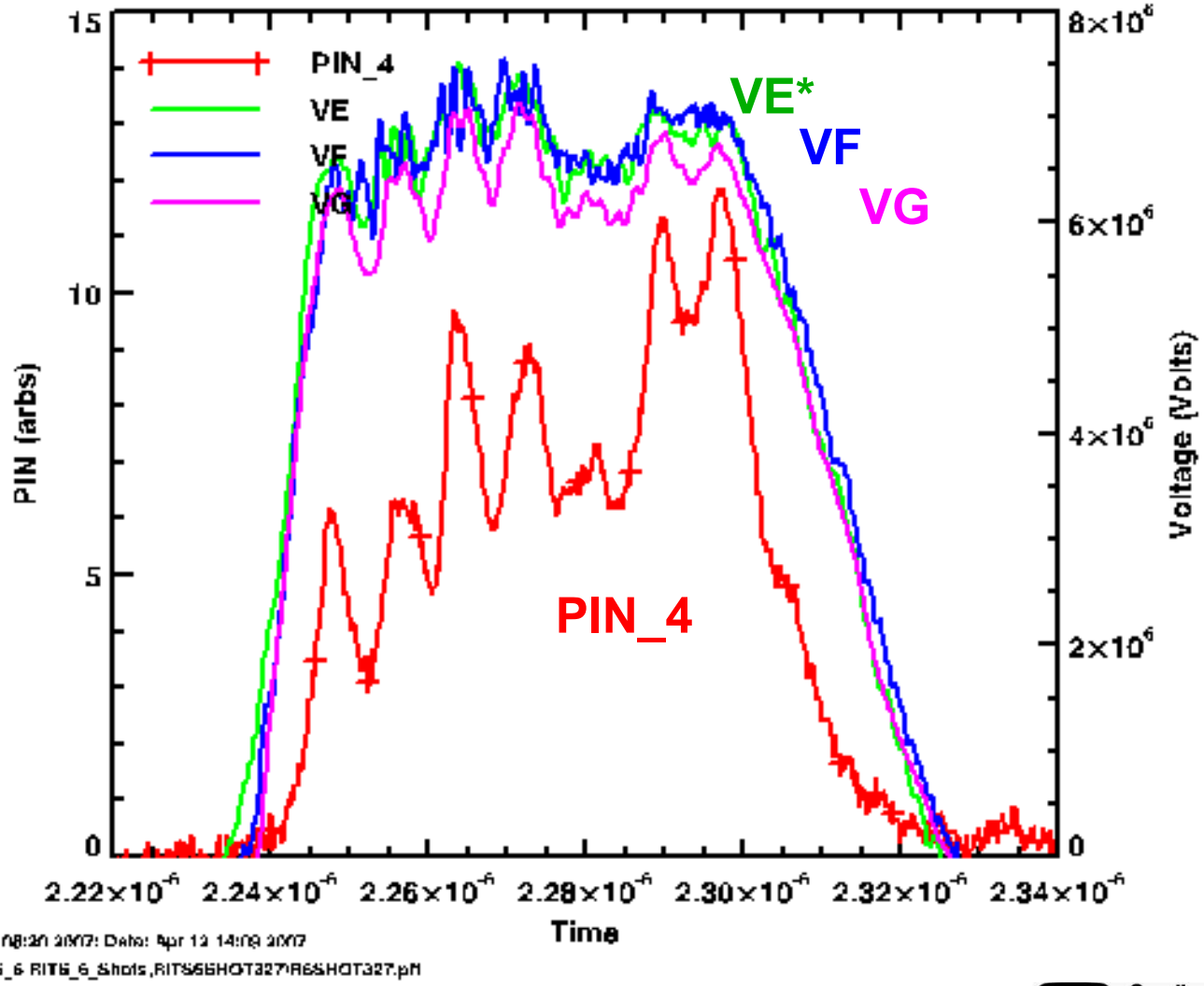
125 MHz Signatures on RITS-6

Paraxial Diode Shot 327

255 Rads @ 1m
(highest for paraxial series)

125 MHz oscillation amplitude is amplified in dustbin



Plot: Apr 30 08:20 2007; Date: Apr 12 14:09 2007
File: C:\RITS_6 RITS_6_Shots,RITS6SHOT327\R6SHOT327.pH

4 *voltages calculated using Mendel formula and filtered w/ 350 MHz for presentation.

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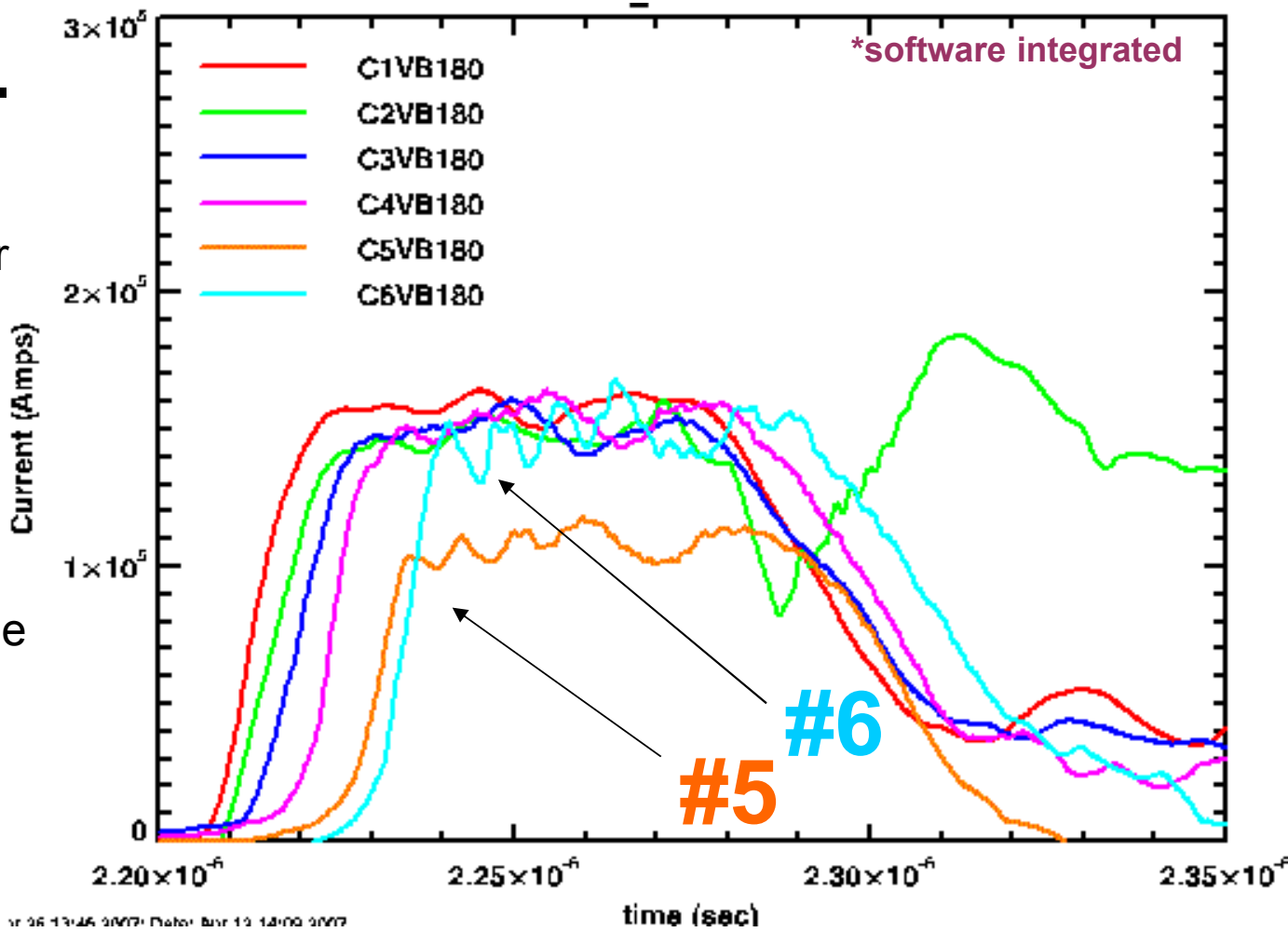
Shot 327

Small amplitude ~125 MHz oscillations appear on Cavity B-dots.

Oscillation amplitude increased between Cavities 5 and 6.

Detect smaller amplitude 125 MHz in Cavity 4.



Perhaps, an asymmetric MITL-cavity (single feed) coupling phenomenon, which gets worse after each stage….

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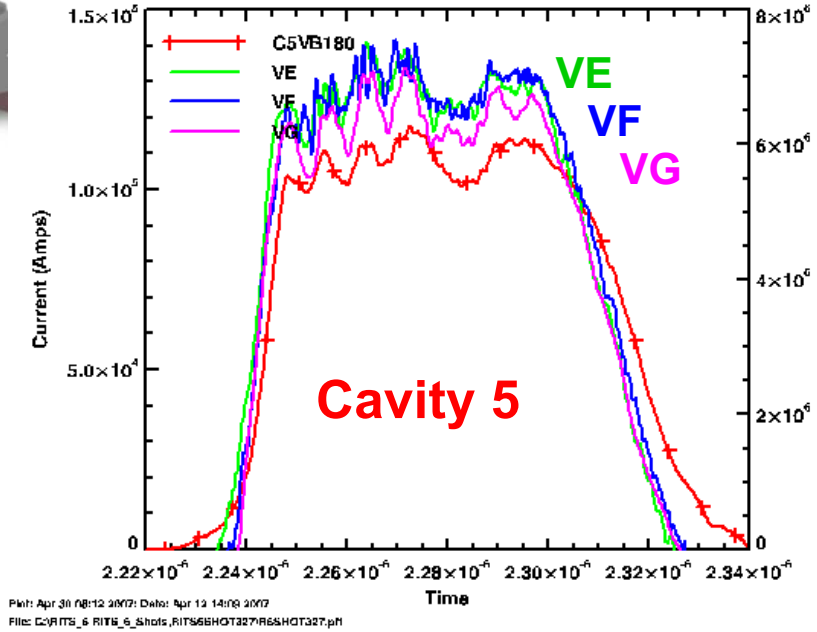
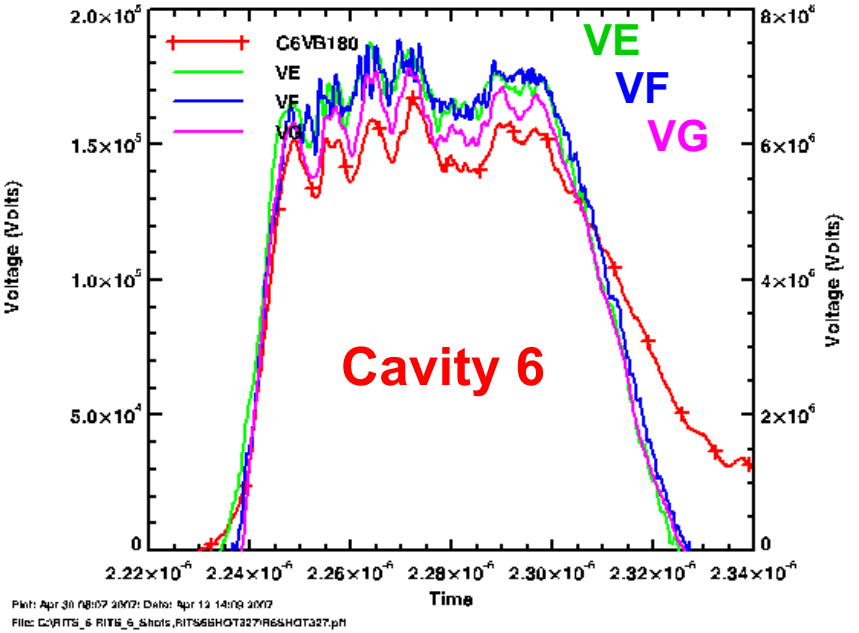
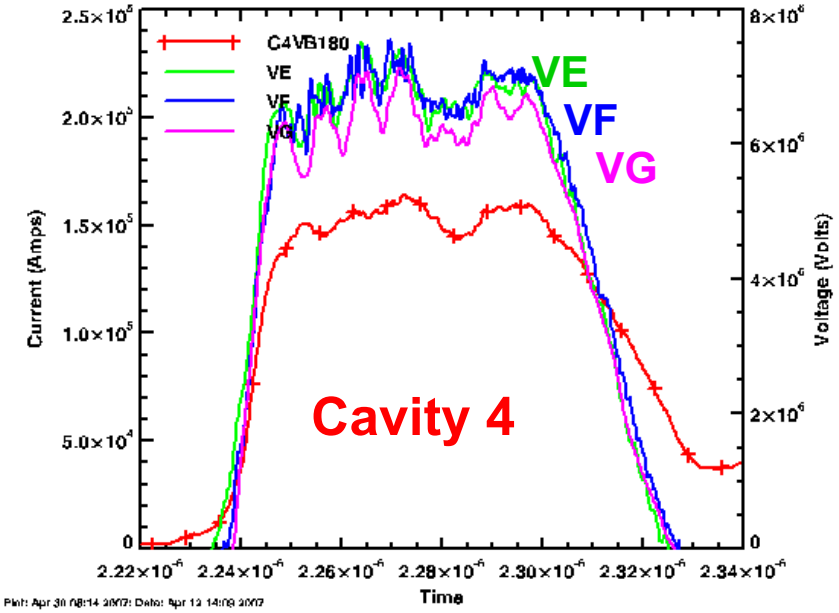
Shot 327







*Currents for Voltage calc's filtered w/ 350 MHz
Cavity 6 software integrated, not filtered

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Where we're at

- This is still a work in progress!
- Appears that ~125 MHz oscillations originate in the MITL-cavity regions, upstream of the diode.
  - Amplitude of oscillations increases from cavity #4 to #6
- 3-D LSP simulations show some initial agreement with formation of lower frequency oscillations (~50 MHz)