

**DrivenOscillation**



# Vertical AC Dipole Setup

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# Reason, Goal, and Plan

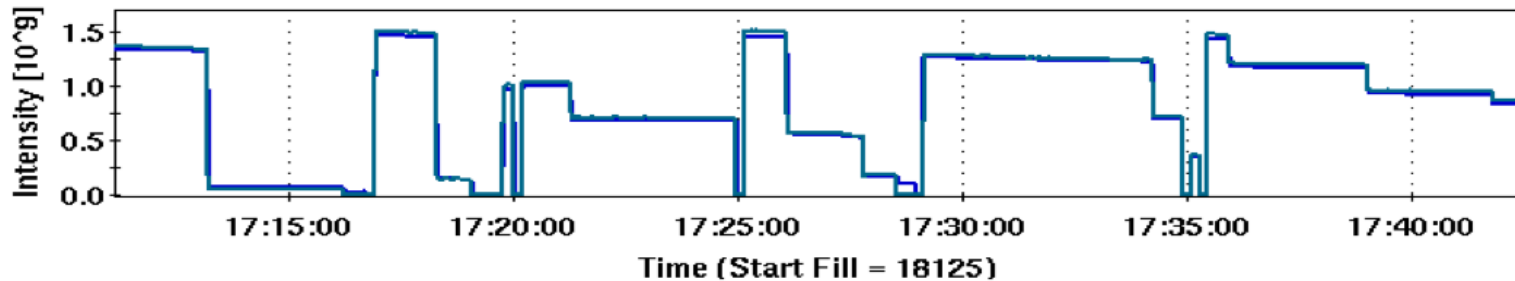
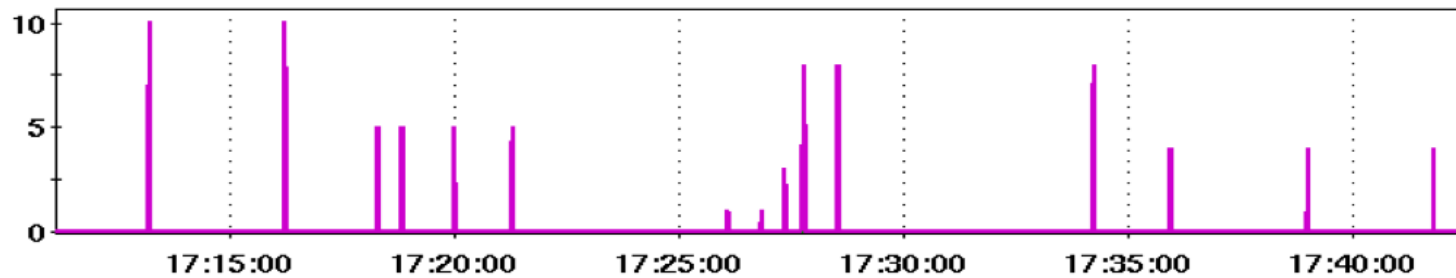
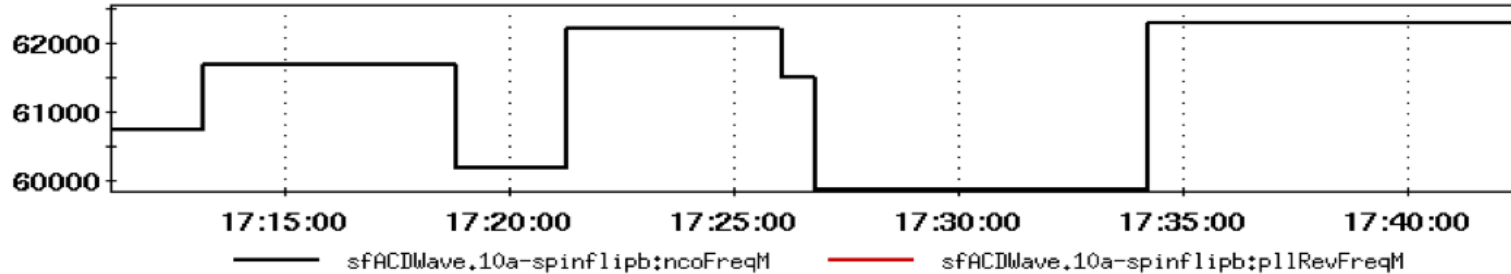
## Driven Oscillation



- We lost the vertical ac dipole in IP4 during the 56MHz cavity installation
  - Ceramic pipe was cracked due to the not-so-well-fit transition part between the cavity and the ac dipole
- We decided to convert one of the ac dipoles in spin flipper (Blue ring) to the IP4 type of ac dipole for beam dynamics studies
  - Thanks to Peter, Joe, Henry, Tony, etc from BI group
  - Cap banks of Ac dipole #5 in the tunnel was modified to resonate the magnet at  $\sim 61\text{kHz}$  during maintenance day
- Confirmed/measured its response with beam in APEX 3/26

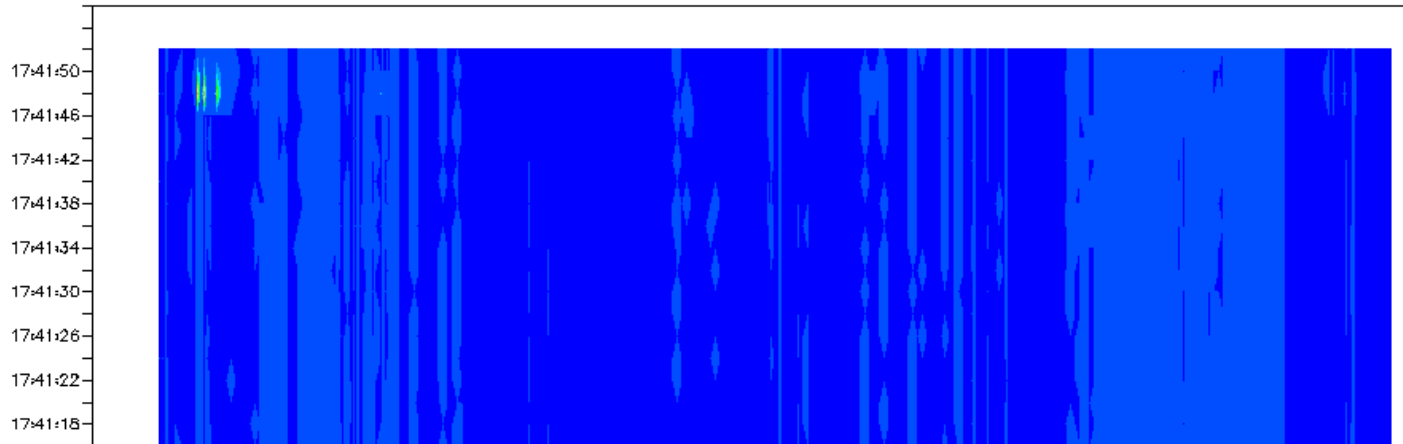
# Overview of the Study

## Driven Oscillation

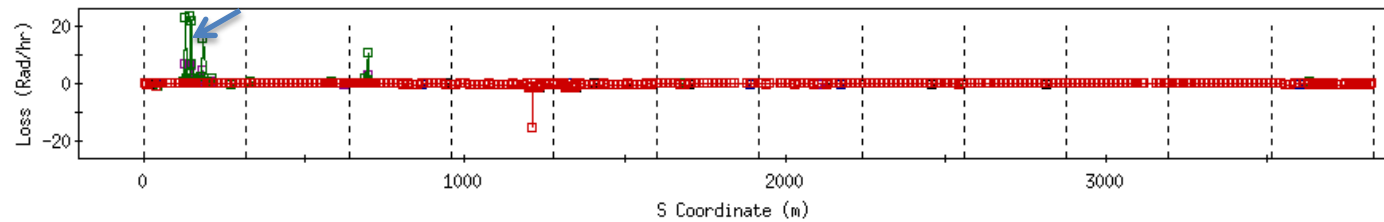


# Loss pattern

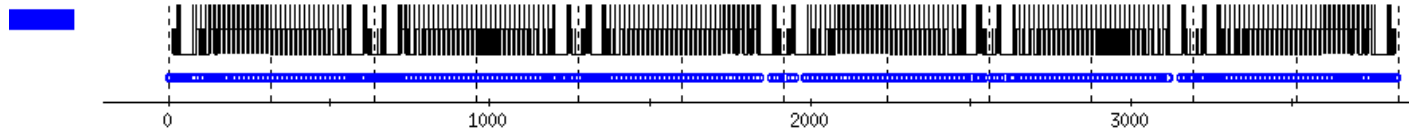
## Driven Oscillation



### Injection area



Beam ==> Lattice: Blue

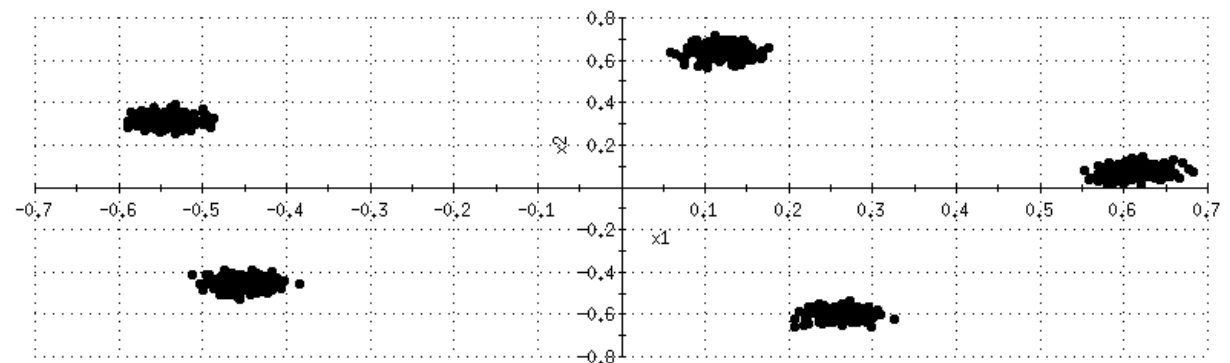
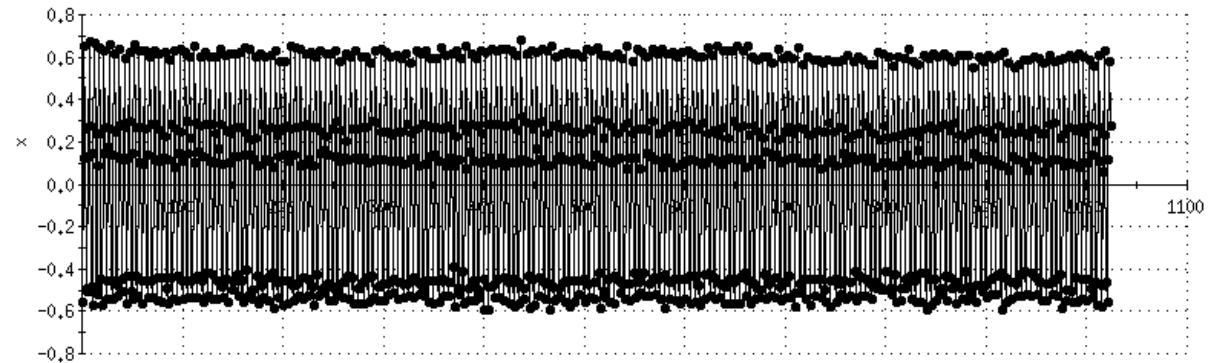


# Highest Coherent Oscillation Achieved

## Driven Oscillation

- Only at injection
- But, only  $\sim 0.7\text{mm}$  in the mid of the arc heavy losses seen at injection area
- What's the aperture at injection area?

Phase Plot Wed Mar 26 17:41:48 2014



# Conclusion and Plan

## Driven Oscillation



- Conclusions
  - Thanks to the folks from BI group, vertical ac dipole from spin flipper worked at higher frequency as expected 😊
  - But, we were not able to excite higher than 0.7mm coherence excitation at injection due to losses at injection area
- Proposal
  - To do a quick aperture scan at RHIC injection area to see what's the available aperture there