

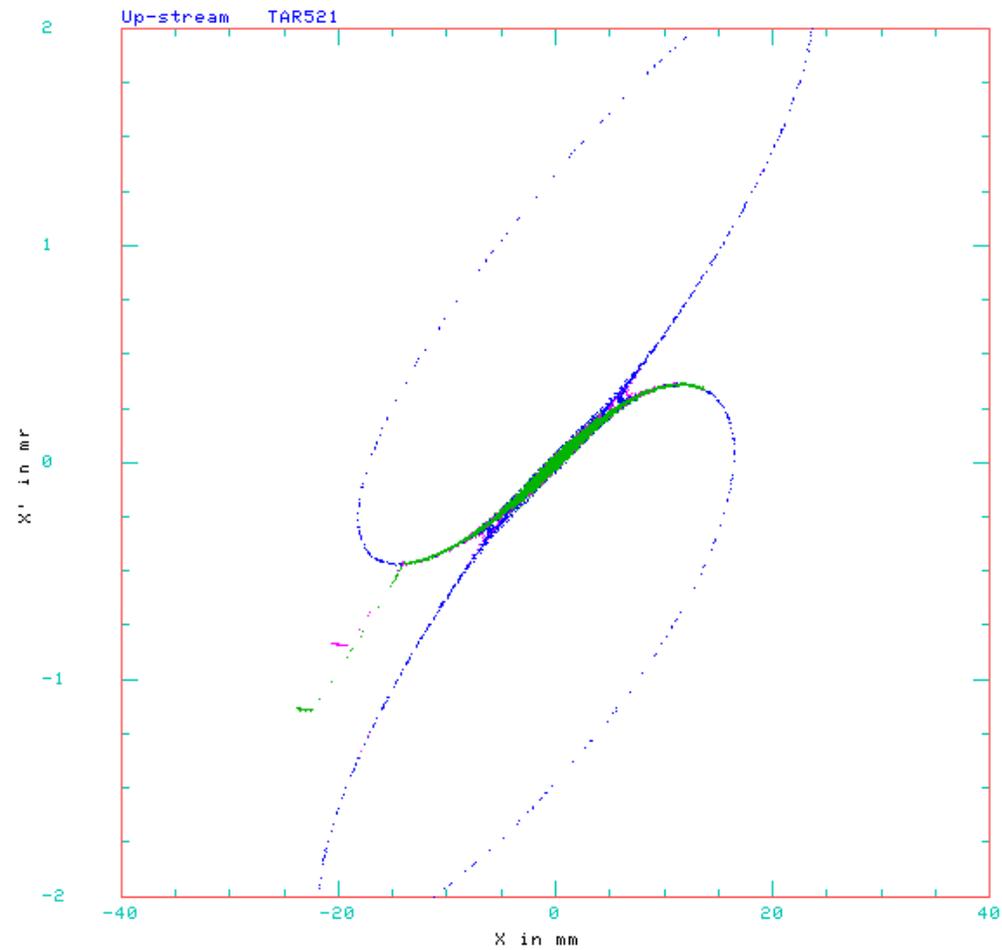
A  
Third Septa  
at MI32

03/07/2012  
Ming-Jen Yang, MI

# Motivation

- Reduce beam loss at MI52
  - Injection.
  - Lambertson extraction
    - ✓ Beam in kicker gap
    - ✓ Slow extraction
  - Septa
- Septa at MI32
  - Short straight will be empty.
  - Diverting the inevitable septa loss
    - ✓ Clean septa operation at MI520.
    - ✓ Use thinner wire.

# Standard 520 Septum Operation



Mar 07, 2012

# Setting used in I90 for the simulation

Edit device

```

*Device type: [Branch]      *Update: [Manual]
*Attribute: [Special  ]    *Find: [      ]
*Mode: [Modify]           *Add      *Commands*
Branch septum beamline    station x(mm) x'(mr) y(mm) y'(mr)
EXTRACT_P1 -16            2503.634 0      0      0      0
DUMP_IT -16              0      0      0      0      0
    
```

DB device page

```

*Page length: [ 63]      *History depth:[15]
DB_name      Setting  prev_set  reading  prev_read
I:IQD      Amps      0          2802.179 2802.182
MIQB_D     Amps      0          -2802.179 -2802.182
MIQC_D     Amps      0          -2802.179 -2802.182
MIQD_D     Amps      0          -2802.179 -2802.182
I:IQF      Amps      0          2866.899 2866.891
MIQB_F     Amps      0          2866.899 2866.891
MIQC_F     Amps      0          2866.899 2866.891
MIQD_F     Amps      0          2866.899 2866.891
I:MIBEND   Amps      0          6913.998

HQ1_CIR    AMPS      0          -7.3     -7.5
I:QC206    Amps      0          -7.3     -7.5
I:QC208    Amps      0          7.3      7.5
I:QC210    Amps      0          -7.3     -7.5
I:QC212    Amps      0          7.3      7.5
X_QC506    Amps      0          7.3      7.5
x_QC508    AMPS      0          -7.3     -7.5
x_QC510    AMPS      0          7.3      7.5
x_QC512    AMPS      0          -7.3     -7.5

HQ2_CIR    AMPS      0          -3        0
I:QC328    Amps      0          -3        0
I:QC330    Amps      0          3         0
I:QC332    Amps      0          -3        0
I:QC334    Amps      0          3         0
x_QC628    AMPS      0          3         0
x_QC630    AMPS      0          -3        0
x_QC632    AMPS      0          3         0
x_QC634    AMPS      0          -3        0
    
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DB device page

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*Page length: [ 63]      *History depth:[15]
DB_name      Setting  prev_set  reading  prev_read
I:SP520A    KV          0          100      200
I_ES52AT    Mils      0          -600     -2000
I:ES52AU    Mils      0          -600     -2000
I:ES52AD    Mils      0          -525     -600
I_ES52BT    MILS      0          -520     -505
I:ES52BU    Mils      0          -520     -505
I:ES52BD    Mils      0          -445     -430

I_ES322V    KV          0          0         100
ES322_T     MILS      0          -2000    -400
ES322_U     MILS      0          -2000    -400
ES322_D     MILS      0          -2100    -500

I_ES320W    KV          0          0         0
ES320A_T    MILS      0          -2000    -2000
ES320A_U    MILS      0          -2000    -2000
ES320A_D    MILS      0          -2000    -2000
    
```

```

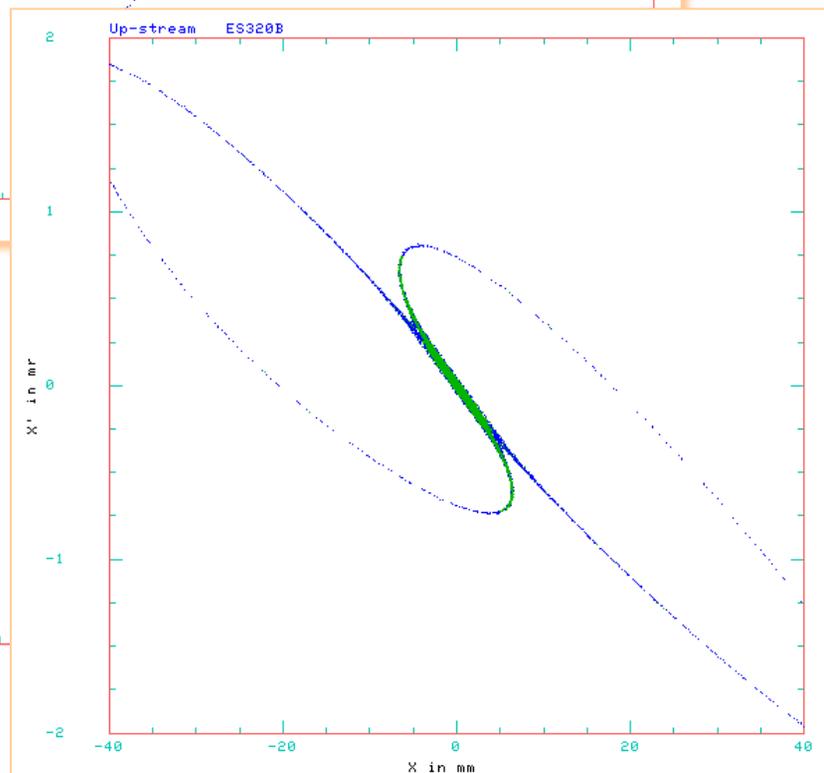
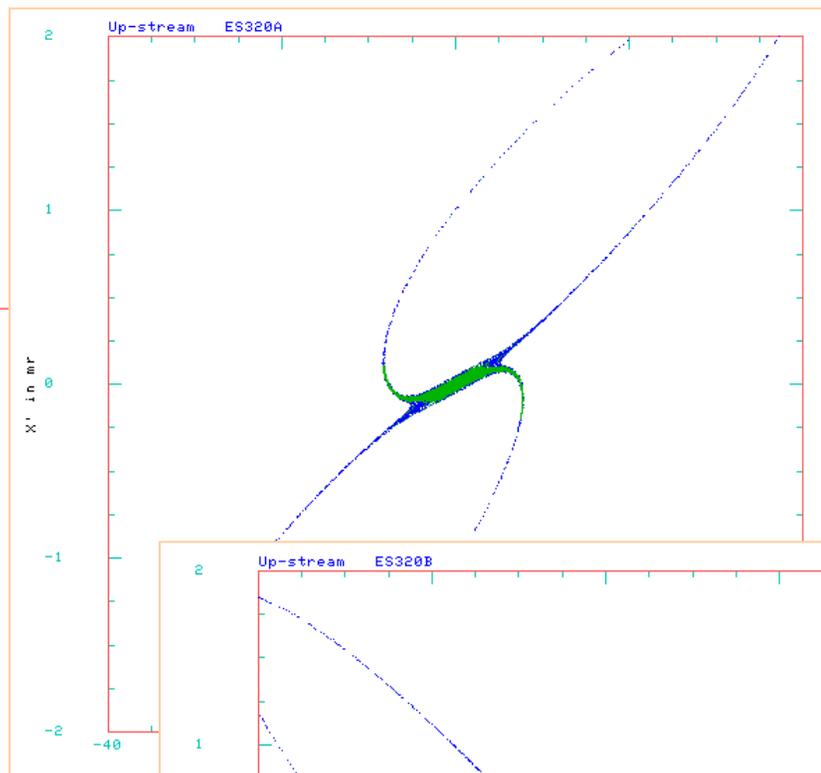
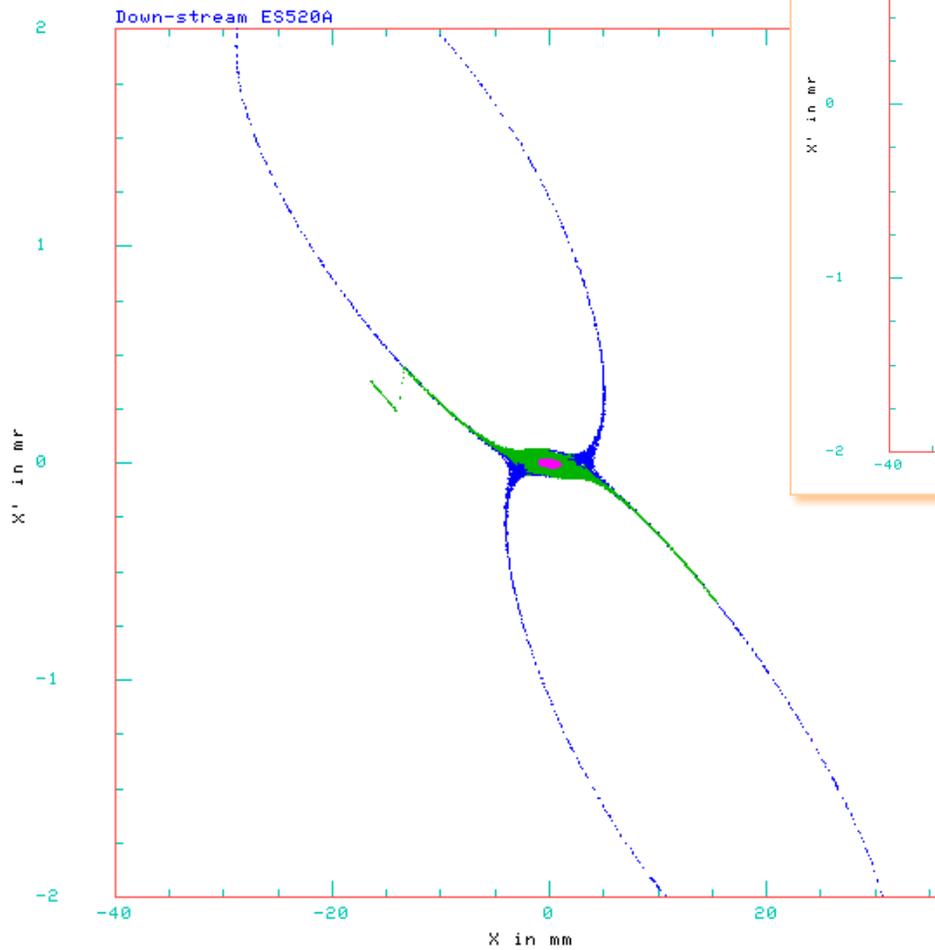
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ng prev_read
100
-400
-400
-500
    
```

```

IQB_OCTF  KGMS  0          809
IQC_OCTF  KGMS  0          853
IQD_OCTF  KGMS  0          731
IQB_OCTD  KGMS  0          785
IQC_OCTD  KGMS  0          828
IQD_OCTD  KGMS  0          710
    
```

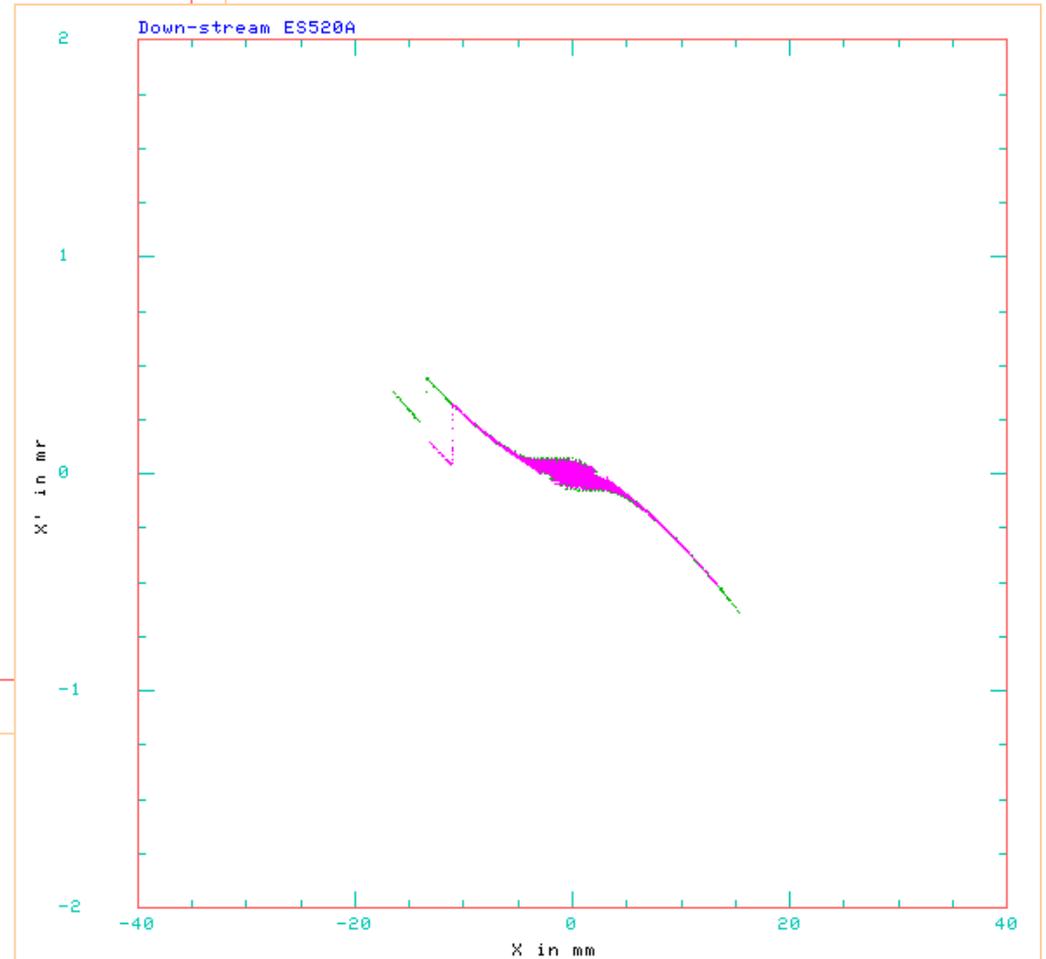
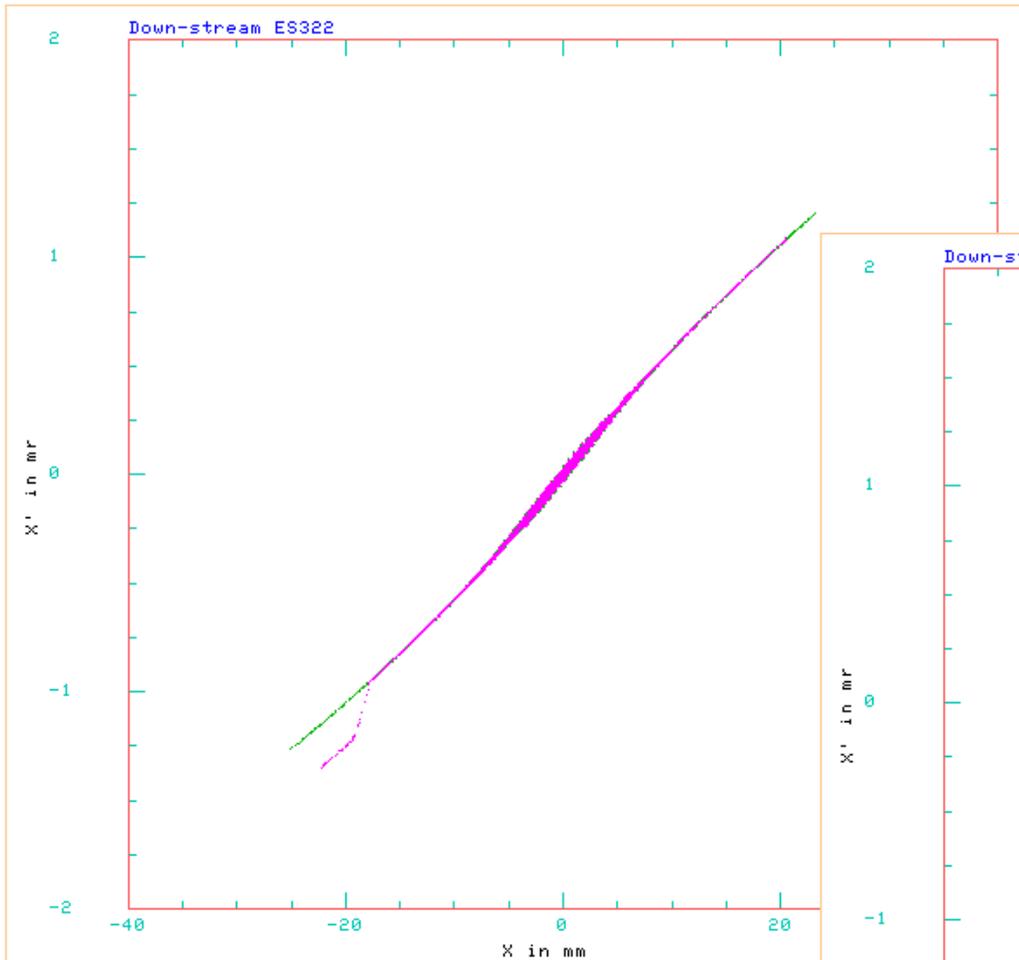
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# Phase space at ES320A & ES320B using ES520 septa



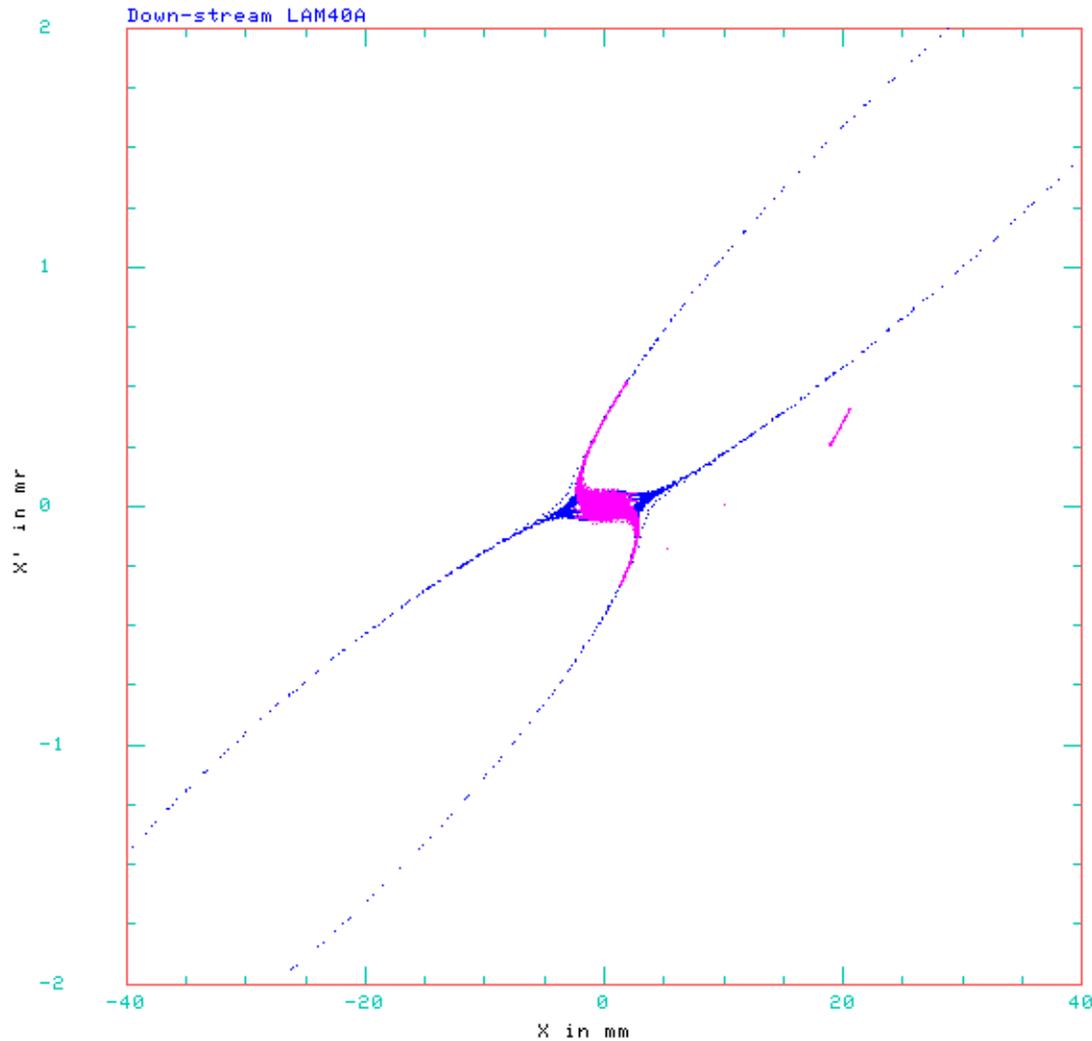
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# Effect of ES322 at ES520A



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# Doubling up the strength at ES322



At ES322 dns

At ES522A dns

At Target 521

At LAM40A dns

# Conclusion

- 3<sup>rd</sup> septum at MI320
  - Phase space orientation is not suitable as septa location.
- 3<sup>rd</sup> septum at MI322
  - Phase advance to MI520
    - ✓ appears to be multiple of 360 degree.
  - Will not help on reducing loss at MI520.
- Other options
  - Try MI222 location for the 3<sup>rd</sup> septum.
  - Install two septa at MI322 location
    - ✓ Making ES520A & B the active spares.