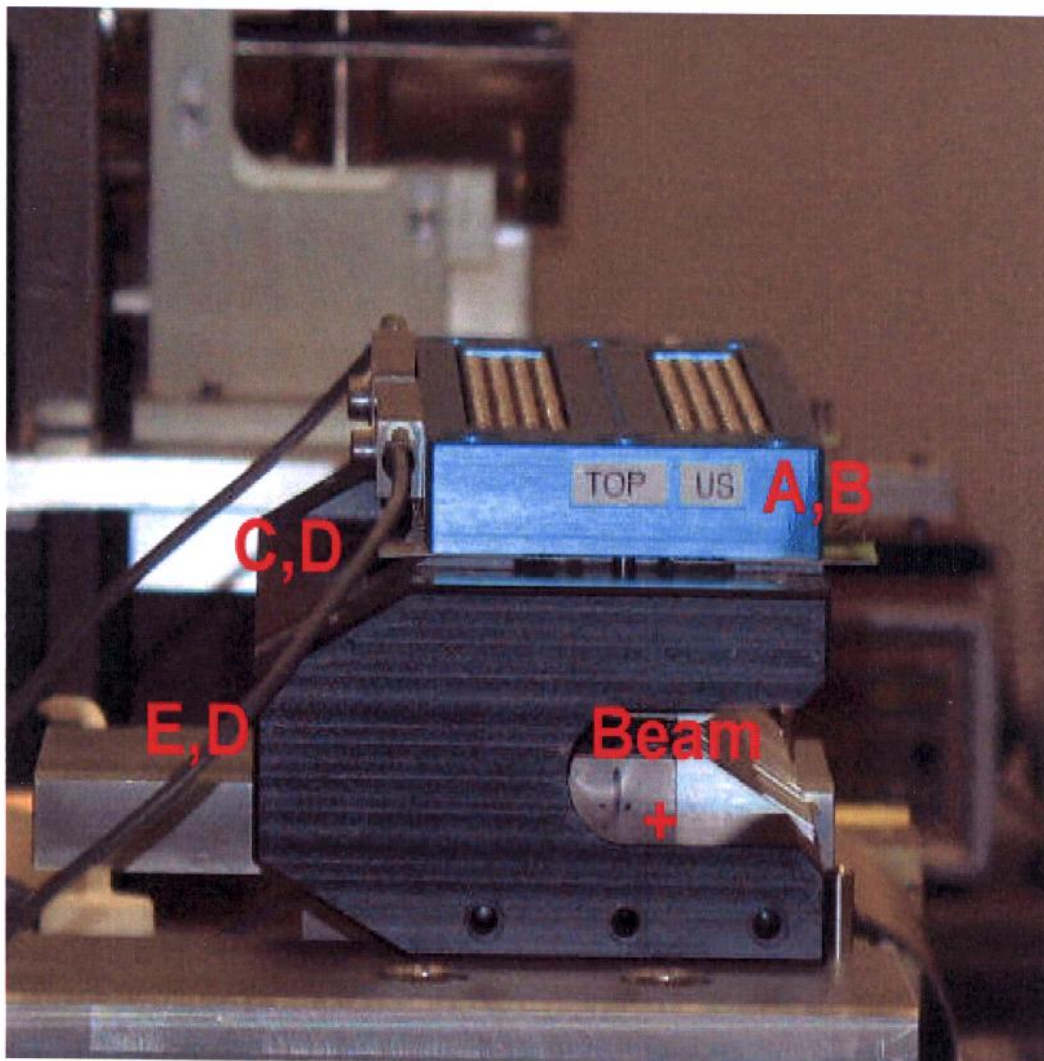


4-1-10

J.M., L.G.

ECHO 7-20 UNDULATOR



4-1-10

J.M., L.G.

**ECHO 7-20 UNDULATOR**

**INCHES**

<b>T/B</b>	<b>X</b>	<b>Y</b>	<b>Z</b>
<b>A</b>	-1.285	2.388	-6.693
<b>B</b>	-1.289	2.388	6.687
<b>C</b>	2.905	1.934	-6.691
<b>D</b>	2.902	1.934	6.689
<b>E</b>	4.126	-0.006	-6.691
<b>F</b>	4.126	-0.006	6.689

**MM**

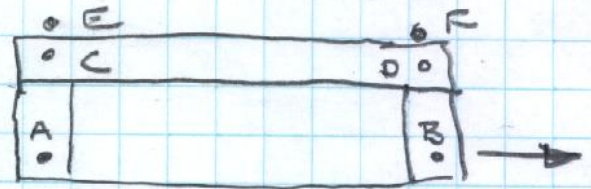
<b>T/B</b>	<b>X</b>	<b>Y</b>	<b>Z</b>
<b>A</b>	-32.6390	60.6552	-170.0022
<b>B</b>	-32.7406	60.6552	169.8498
<b>C</b>	73.7870	49.1236	-169.9514
<b>D</b>	73.7108	49.1236	169.9006
<b>E</b>	104.8004	-0.1524	-169.9514
<b>F</b>	104.8004	-0.1524	169.9006

MMF  
ECHO 7-20UND.

4-1-10  
JM, LG.

(X)

$$\begin{aligned} \text{PM1 } .139985\text{M} &= 5.511'' \\ \text{PM4 } .139710\text{M} &= 5.500'' \end{aligned}$$



BULKED IN ON PM'S

CHECKED CARRIAGE

IT WAS GOOD TO PM'S

USED PM4 TO GET LOS

$$\begin{array}{r} 28.851 \\ 5.500 \\ \hline + 34.351 \text{ LOS} \end{array}$$

$$\begin{array}{r} \text{A) } 34.636 \\ \hline 35.636 \\ 34.351 \\ \hline -1.285 \end{array}$$

$$\begin{array}{r} \text{B) } 34.640 \\ \hline 35.640 \\ 34.351 \\ \hline -1.289 \end{array}$$

$$\begin{array}{r} \text{C) } 30.446 \\ \hline 31.446 \\ 34.351 \\ \hline 2.905 \end{array}$$

$$\begin{array}{r} \text{D) } 30.449 \\ \hline 31.449 \\ 34.351 \\ \hline 2.902 \end{array}$$

$$\begin{array}{r} \text{E) } 29.225 \\ \hline 30.225 \\ 34.351 \\ \hline 4.126 \end{array}$$

$$\begin{array}{r} \text{F) } 29.225 \\ \hline 30.225 \\ 34.351 \\ \hline 4.126 \end{array}$$

MMF  
ECH 07-20 UNOULATOR

4-1-10  
JM, LG

Y

PM 4  
 $.091239m = 3.592''$

PM 1  
 $.091271m = 3.593''$

$$\begin{array}{r} 6.116 \\ 1. \text{---} \\ \hline 7.116 \\ 3.592 \\ \hline 10.708 \end{array}$$

$$\begin{array}{r} 6.112 \\ 1. \text{---} \\ \hline 7.112 \\ 3.593 \\ \hline 10.705 \end{array}$$

$\bar{m} = 10.707 \text{ HI}$

A)  $\begin{array}{r} 7.319 \\ 1. \text{---} \\ \hline 8.319 \\ 10.707 \end{array}$

$\boxed{2.388}$

B)  $\begin{array}{r} 7.319 \\ 1. \text{---} \\ \hline 8.319 \\ 10.707 \end{array}$

$\boxed{2.388}$

C)  $\begin{array}{r} 7.773 \\ 1. \text{---} \\ \hline 8.773 \\ 10.707 \end{array}$

$\boxed{1.934}$

D)  $\begin{array}{r} 7.773 \\ 1. \text{---} \\ \hline 8.773 \\ 10.707 \end{array}$

$\boxed{1.934}$

E)  $\begin{array}{r} 9.713 \\ 1. \text{---} \\ \hline 10.713 \\ 10.707 \end{array}$

$\boxed{-0.006}$

F)  $\begin{array}{r} 9.713 \\ 1. \text{---} \\ \hline 10.713 \\ 10.707 \end{array}$

$\boxed{-0.006}$

MMF  
ECHO 7-20 UND.

4-1-10  
JM, LG.

⑦ U/S FACE  
-) 7.504  
+) 7.504  
5.000  
5.042  
8.000  
7.782  
5.485 -  
5.485 -

-12.989 LOS

A) 5.296

1 —  
6.296  
12.989  
-6.693

B)

13.380 A-B  
6.693  
-  
6.687

C) 5.298

1 —  
6.298  
12.989  
-6.691

D) 18.678

1 —  
19.678  
12.989  
6.689

E) 5.298

1 —  
6.298  
12.989  
-6.691

F) 18.678

1 —  
19.678  
12.989  
6.689

1003

~~0~~

30.000 + 1

28.429 + 1

26.000 + 1

27.354 + 1

28.848 - 1 ✓

28.851 - 1 ✓

28.851 + 5.500 = 34.351

MMF  
CHECKING X ON GRANITE  
TO AM'S

4-1-10  
JM, LG

KUGLER CARRIAGE

u/s 14.170

D/S 14.171

~ DIST. (+) FACE FROM E

4-1-10

3.118"

FROM  
DRAWINGS

FOUND 3.126"

**Griffin, Levirt**

---

**From:** Levashov, Yurii I.  
**Sent:** Wednesday, March 31, 2010 2:31 PM  
**To:** Griffin, Levirt  
**Cc:** Gassner, Georg L.  
**Subject:** ECKO7-20 undulator fiducialization

Hi Levirt,

Would you mind doing the measurements tomorrow morning?

If magnetic axis is zero,  $x=0$  and  $y=0$ , then the numbers for the reference magnet tooling ball centers are:

URM PM4

$X(x1) = 0.139710m$

$Y(y1) = 0.091239m$

DRM PM1

$X(x1) = 0.139985m$

$Y(y1) = 0.091271m$

$X(x1) 091$   
Regards,

Yurii