

ATF2 VERY LOW RIPPLE BEAM LINE

I

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1. Motivation:

First time requirement of a very low ripple power supply for the beam line.

We will achieve the world best performance.

Goal: a beam line of 1 ppm ripple

1. Integrated system of Magnet and Power Supply and BPM

- (i) Magnet: Reconsider how to determine parameters from a Power Supply designer's view.**
- (ii) Power supply: Revisit Common Mode Rejection.**
- (iii)...how to combine BPM?**

$$L = 8\mu_0 m^2 N^2 l_G$$

$$R = \frac{l_G N}{\sigma ab}$$

$$g = \frac{2\mu_0}{R_0^2} NI$$

(ii) optical parameter (Kuroda)

QUAD QA1F =(L =.18 K1 =.666191185274)

QA2F =(L =.18 K1 =.45001667625)

QA3F =(L =.18 K1 =1.7284024032)

QA4F =(L =.18 K1 =-1.00576517907)

QA5F =(L =.18 K1 =-.169837718612)

QA6F =(L =.36 K1 =-.637545532065)

QA7F =(L =.18 K1 =.573415442084)

QC1F =(L =.4 K1 =.3060810846656)

QB1F =(L =.36 K1 =-.3933286196504)

QB2F =(L =.36 K1 =.2929202228076)

QB3F =(L =.18 K1 =.1999790957722)

QB4F =(L =.36 K1 =-.399964262426)

QB5F =(L =.18 K1 =.1137582624753)

QC2F =(L =.4 K1 =.3060810846656)

QC3F =(L =.4 K1 =-.67)

(iii)

| K | lg | g | NI | N | R | L | L/R | V |
|-----------------|----------------|----------------|----------------|---------------|------------------|------------------|----------------|----------------|
| 0.66619 | 0.18000 | 15.796 | 2514.1 | 50.000 | 0.0062069 | 0.018095 | 2.9153 | 1.5517 |
| 0.45002 | 0.18000 | 10.670 | 1698.3 | 33.000 | 0.0040966 | 0.0078822 | 1.9241 | 1.0241 |
| 1.7284 | 0.18000 | 40.982 | 6522.7 | 130.00 | 0.016138 | 0.12232 | 7.5798 | 4.0345 |
| -1.0058 | 0.18000 | -23.848 | -3795.6 | 75.000 | 0.0093103 | 0.040714 | 4.3730 | 2.3276 |
| -0.16984 | 0.18000 | -4.0270 | -640.94 | 12.000 | 0.0014897 | 0.0010423 | 0.69967 | 0.37241 |
| -0.63755 | 0.36000 | -7.5585 | -1203.0 | 24.000 | 0.0059586 | 0.0083382 | 1.3993 | 1.4897 |
| 0.57342 | 0.36000 | 6.7982 | 1082.0 | 21.000 | 0.0052138 | 0.0063839 | 1.2244 | 1.3034 |
| 0.30608 | 0.40000 | 3.2659 | 519.80 | 10.000 | 0.0027586 | 0.0016084 | 0.58306 | 0.68966 |
| -0.39333 | 0.36000 | -4.6631 | -742.18 | 14.000 | 0.0034759 | 0.0028373 | 0.81629 | 0.86897 |