

BROOKHAVEN NATIONAL LABORATORY

MAGNET DIVISION NOTES

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Date: June 17, 1991  
No: 380-7 (SSC-MD-265)  
Task Force: Magnet Assembly  
Title: Effect of  $\mu \neq 1$  of Quench Resistors on the Magnetic Properties of SSC 50 mm Dipole


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Magnet Division  
M E M O R A N D U M

DATE: June 17, 1991  
TO: Mike Anerella  
FROM: Ramesh Gupta   
SUBJECT: Effect of  $\mu \neq 1$  of Quench Protection Resistors  
on the Magnetic Properties of SSC 50 mm Dipole

In your memo of 6/10/91 to G. Morgan you gave the dimensions and permeability (as measured by Arup Ghosh) of quench protection resistors in SSC 50 mm aperture magnets. The resistors are made of 304 SST. They are 4 mil thick and 1.25 inch wide. They are located on the outside of the outer coil, starting 10 mil below the pole and going downward azimuthally. The permeability of the material is 1.047 at  $H = 0.02$  T , 1.037 at  $H = 0.1$  T, 1.019 at  $H = 0.4$  T and 1.011 at  $H = 1$  T.

The effect of this on field harmonics above 0.66 tesla central field is *insignificant*.  $b_2$  changes by less than 0.01 unit and  $b_4$  and higher harmonics by less than 0.001 unit. The effect on transfer function is much less than 1 part in 10,000.

cc: Arup Ghosh  
Gerry Morgan  
Peter Wanderer  
Erich Willen