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SYNCHROTRON LIGHT FACILITY - WIGGLER/BEAMLINE VI

WIGGLER - MAGNETIC DESIGN

PARTIAL SUMMARY OF COMPUTER ANALYSIS
THIS NOTE CONSTITUTES A PARTIAL SUMMARY OF COMPUTER ANALYSIS OF THE BEAMLINE VI WIGGLER MAGNET. THE MAGNET WAS OPTIMIZED FOR $\lambda$/GAP OF 7/8. THE OPTIMIZED GEOMETRY WAS THEN CHANGED TO SIMULATE AN INCREASE IN GAP FROM 0.8 CM. TO 1.2 CM. POLE TO POLE.

THE POLE MATERIAL USED IN THESE MODELS WAS VANADIUM PERMENDUR. AN $H_c$ VALUE OF 9.0 KG. WAS USED FOR THE PERMANENT MAGNET MATERIAL.

AS A LOW PERFORMANCE COMPARISON THE $\lambda$/GAP = 7/8 GEOMETRY WAS RERUN WITH IRON INSTEAD OF VANADIUM PERMENDUR AS THE POLE MATERIAL AND WITH AN $H_c$ VALUE OF 7.95 KG. INSTEAD OF 9.0 KG.

THE RESULTS OF THESE RUNS ARE SUMMARIZED IN THE TABLE BELOW. GEOMETRY INFORMATION AND FIELD PLOTS ARE ON THE FOLLOWING PAGES. THE OPTIMIZED RUN WITH $\lambda$/GAP = 7/8 IS DESIGNATED REC201 AND THE LOW PERFORMANCE RUN IS REC201A. THE RUN WITH GAP INCREASED TO 1.2 CM IS DESIGNATED REC203.

<table>
<thead>
<tr>
<th>RUN</th>
<th>$B_0$</th>
<th>$H_c$</th>
<th>$B_p$</th>
<th>$\lambda$</th>
<th>GAP</th>
<th>POLE MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC201</td>
<td>17503</td>
<td>9000</td>
<td>1.8</td>
<td>7.0</td>
<td>0.8</td>
<td>VANADIUM PERMENDUR</td>
</tr>
<tr>
<td>REC201A</td>
<td>15576</td>
<td>7950</td>
<td>1.6</td>
<td>7.0</td>
<td>0.8</td>
<td>IRON</td>
</tr>
<tr>
<td>REC203</td>
<td>12990</td>
<td>9000</td>
<td>1.7</td>
<td>7.0</td>
<td>1.2</td>
<td>VANADIUM PERMENDUR</td>
</tr>
</tbody>
</table>

$B_0$ = MAX. FIELD IN GAP
$B_p$ = UNIFORM FIELD IN PERM. MAG. MATERIAL
$\gamma_C = 7/8$
$B_r = 9000 \text{ G}$.
$B_p = 1.8 \text{ kG}$.
$B_0 = 17503 \text{ G}$.

POLE MAT'L:
VANADIUM PERMENDUR

S. F. = 1.8
\[ \gamma_{\text{cap}} = 71.2 \]
\[ B_r = 9000 \text{ G} \]
\[ B_p = 1.7 \text{ kG} \]
\[ B_0 = 12970 \text{ G} \]

**Pole Mat'l:**
Vanadium Permendur

**S. F. = 1.8**
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