FCalchik Support Structures
(Table, Excluders, etc.)
Top Plate Drawings
Shipping
Notes
General Layout
Experimental Hall
Protvino, Russia
Notes
Notes
Temperature Probe Data
Notes
Pictures
<table>
<thead>
<tr>
<th>Image Description</th>
<th>Text Description</th>
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</thead>
<tbody>
<tr>
<td>FCalchik Pieces</td>
<td></td>
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<tr>
<td>FCalchik Pieces View 2</td>
<td></td>
</tr>
<tr>
<td>FCalchik Pieces Top View</td>
<td></td>
</tr>
<tr>
<td>FCalchik Rod and Tube Size</td>
<td></td>
</tr>
<tr>
<td>Image 1: FCalchik front face, Tubes installed</td>
<td></td>
</tr>
<tr>
<td>Image 2: FCalchik inside</td>
<td></td>
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<tr>
<td>Image 3: FCalchik top view of tube installation</td>
<td></td>
</tr>
<tr>
<td>Image 4: Side view of tube installation</td>
<td></td>
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</tbody>
</table>
Cooling loops installed

Cooling Loops
Progress as of 6/14/2006
FCalchik with test excluder

Top view of FCalchik with test excluder

Another view of test excluder and FCalchik
<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>FCalchik with Table, Excluders, Hanging Rods and Cooling loop extentions</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>Close up of FCalchik and Excluders</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Side View FCalchik pin/Excluder distances</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Top View of FCalchik signal end and Excluder</td>
</tr>
<tr>
<td>Tools Shipped:</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td></td>
</tr>
<tr>
<td>Wrenches</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipped:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kapton and Brass washers</td>
</tr>
<tr>
<td>Pins</td>
</tr>
<tr>
<td>Pinning tool</td>
</tr>
<tr>
<td>Vice Grips</td>
</tr>
<tr>
<td>Wire cutter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipped:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kapton sheets</td>
</tr>
<tr>
<td>Zip Ties</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipped:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber Gloves</td>
</tr>
<tr>
<td>Wipes (striped and kimwipes)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipped:</th>
</tr>
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<tbody>
<tr>
<td>Swabs</td>
</tr>
</tbody>
</table>
IHEP Protvino, Russia
12/10/2006 – 12/16/2006

<table>
<thead>
<tr>
<th>IHEP Experimental Hall</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>FCalchik Top Plate</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>FCalchik Top Plate</th>
</tr>
</thead>
</table>
Top Plate Bottom

Top Plate Close up
Note: Spots on top plate were cleaned off

Cleaning Setup

Cleaning Top Plate
<table>
<thead>
<tr>
<th>Image</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>FCalchik Haning from Top Plate</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>FCalchik hanging from Top Plate Signal end</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Front view of inner-connect boards (footballs) connected to signal pins.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Signal end showing connected inner-connect boards (footballs).</td>
</tr>
</tbody>
</table>
Completed assembly

Completed assembly
View 2
<table>
<thead>
<tr>
<th>Side view</th>
<th>Showing distance between Excluders and the FCAlchik</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top View</td>
<td>Excluders and FCAlchik</td>
</tr>
<tr>
<td>Completed Assembly</td>
<td>All Connections made including temperature probes</td>
</tr>
<tr>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Wire connections in bottom of the cryostat" /></td>
<td>Wire connections in bottom of the cryostat</td>
</tr>
<tr>
<td><img src="image2.png" alt="Liquid Argon level temperature probes" /></td>
<td>Liquid Argon level temperature probes</td>
</tr>
<tr>
<td><img src="image3.png" alt="Liquid Argon level temperature probes View 2" /></td>
<td>Liquid Argon level temperature probes View 2</td>
</tr>
</tbody>
</table>
Cooling loop temperature probe

Closed cryostat. FCalchik installed.
<table>
<thead>
<tr>
<th>Image</th>
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<tr>
<td><img src="image1" alt="Rob with FCalchik" /></td>
<td>Rob with FCalchik</td>
</tr>
<tr>
<td><img src="image2" alt="John working on HV Distribution Box" /></td>
<td>John working on HV Distribution Box</td>
</tr>
<tr>
<td><img src="image3" alt="Rob working" /></td>
<td>Rob working</td>
</tr>
</tbody>
</table>
| ![Arizona Group with FCalchik in the cryostat.](image4) | Arizona Group with FCalchik in the cryostat.  
Left to Right  
Rob, John, Sasha, Russian Technician |
IHEP Pictures
Pictures can be found at http://home.saske.sk/~ferencei/hilum/techrun.html
<p>| Last two magnets of the beam line # 23 (proton beam from the right side). |
| Wire chamber for the beam positioning with exit window and first scintillator trigger counter S1 (proton beam from the right side). |
| Beam ionization chamber for the beam intensity monitoring with finger for aluminium foil to cross-calibrate absolute beam intensity scale. |
| Beam ionization chamber from back side. |</p>
<table>
<thead>
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</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>Scintillator hodoscope (16 channels in x-/y-planes) with third scintillator trigger counter S3 just after.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>3 movable platforms with remote control equipped with cryostat supports and 2 yellow absorber frames.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Relative beam intensity monitor consisting of scintillator counter triplet placed at 90 degree to the primary proton beam. Monitoring is based on the secondary particle flux from the first iron absorber.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Iron absorber plates.</td>
</tr>
<tr>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image1" alt="Entrance into beam line # 23 experimental area." /></td>
<td>Entrance into beam line # 23 experimental area.</td>
</tr>
<tr>
<td><img src="image2" alt="EMEC cryostat mounted on the movable platform support." /></td>
<td>EMEC cryostat mounted on the movable platform support.</td>
</tr>
<tr>
<td><img src="image3" alt="All 3 cryostats mounted on the movable platform supports (FCAL=KA1, EMEC=KA2, HEC=KA3). Proton beam from the left side." /></td>
<td>All 3 cryostats mounted on the movable platform supports (FCAL=KA1, EMEC=KA2, HEC=KA3). Proton beam from the left side.</td>
</tr>
<tr>
<td><img src="image4" alt="All 3 cryostats connected to cryogenics lines (proton beam from the right side)." /></td>
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</tr>
<tr>
<td>Image description</td>
<td>Text description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>FCAL electrical, cryogenics and vacuum lines.</td>
<td></td>
</tr>
<tr>
<td>Cryostats with the liquid nitrogen dewar.</td>
<td></td>
</tr>
<tr>
<td>Details of the liquid nitrogen dewar top flange.</td>
<td></td>
</tr>
<tr>
<td>Schematics of the cryogenics.</td>
<td></td>
</tr>
<tr>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image" alt="Liquid nitrogen tank" /></td>
<td>Liquid nitrogen tank with cable bundle from the beam hut entering the experimental area (on the floor).</td>
</tr>
<tr>
<td><img src="image" alt="Argon gas valve panel" /></td>
<td>Argon gas valve panel.</td>
</tr>
<tr>
<td><img src="image" alt="Argon gas bottles" /></td>
<td>Argon gas bottles (boiling point = -195.8 degrees (Celsius) for nitrogen, but only -185.7 degrees for argon).</td>
</tr>
</tbody>
</table>
Beam hut.

The cable tray supporting the cables from beam hut.

Cable tray close to the electronics rack outside experimental area.

Electronics racks in the beam hut.
<table>
<thead>
<tr>
<th>Trigger electronics in NIM crate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VME crate with RAID 8235 processor.</td>
</tr>
<tr>
<td>Hodoscope HV power supply system in &quot;MEL&quot; rack together with associated electronics (shapers, scalers) in &quot;SUMMA&quot; standard and pressure regulation crate on the top.</td>
</tr>
<tr>
<td>Image</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Image" /></td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Image" /></td>
</tr>
</tbody>
</table>
Adapter for envisaged amplitude readout of 4 scintillators.

Front-end-board output for amplitude readout of scintillators.

Signal cables entering 3 FADC boards.

VME crate with FANOUT module.
<table>
<thead>
<tr>
<th>Image 96x276 to 294x720</th>
<th>Calibration board: details of power supply, clock, SPAC downloading and calibration trigger connections.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image 96x276 to 294x720</td>
<td>HV crate with 3 ISEG modules and CAN bus cable.</td>
</tr>
<tr>
<td>Image 96x276 to 294x720</td>
<td>Brown HV patch panel for 3 calorimeters and one of the filter boxes (aluminium box) under low voltage tests.</td>
</tr>
</tbody>
</table>