2016 – residual current in V plane

- Current appeared in April 2016, was not there in 2015
- Stable between end of April and end of August 2016
- Should be equal to 0

\[ V_{\text{cath}} = 1625 \, \text{V} \]
\[ V_{\text{BK}} = 1325 \, \text{V} \]

\[ \sim 1.6 \, \mu\text{A} \]

Not nominal conditions: the current depends on the voltage difference between the cathode and BK
Residual current vs Plane-BK voltage difference

- Normal operation for DC4:
  - $V_{\text{cath}} = 1675 \text{ V}$
  - $V_{\text{BK}} = 900 \text{ V}$

- Compromise in 2016:
  - $V_{\text{cath}} = 1625 \text{ V}$
  - $V_{\text{BK}} = 1325 \text{ V}$
DC4 repair

- Fix the problem: chamber must be opened
- Proposal: immediately after the 2016 run
  - During repair: exchange the 32 internal hotlink cables, as done for the external ones in 2016.

Unfortunately, NO manpower to perform the repair!

What is the status?
Plots from DCS

DC04V Plane V/I

15 to 19 October 2016

7 to 25 May 2017

15 to 19 October 2017

1600V

~1.5 µA Stable

~1.7 µA

1 µA
Leakage current (much smaller) in Y plane

DC04Y Plane $V/I$

DC4-Y plane

Much lower current, in 2016 use $V_{BK} = 1200$ (I = 0.6 $\mu$A) - with linear dependence
Repair of DC04 should be planned following the 2018 Drell-Yan run
DVCS run 2017 Status of Saclay DCs (by Charles J. Naim)

- DC04
- DC00 and DC01
### Efficiency for DCs at the nominal tension

<table>
<thead>
<tr>
<th>DC0 plans</th>
<th>HT</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC00X1, DC00X2</td>
<td>1700 V</td>
<td>93.8 % 87.5 %</td>
</tr>
<tr>
<td>DC00Y1, DC00Y2</td>
<td>1700 V</td>
<td>95.6 % 95.4 %</td>
</tr>
<tr>
<td>DC00U1, DC00U2</td>
<td>1700 V</td>
<td>90.5 % 89.6 %</td>
</tr>
<tr>
<td>DC00V1, DC00V2</td>
<td>1700 V</td>
<td>92.1 % 92.2 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DC1 plans</th>
<th>HT</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC01X1, DC01X2</td>
<td>1700 V</td>
<td>93.4 % 94.4 %</td>
</tr>
<tr>
<td>DC01Y1, DC01Y2</td>
<td>1700 V</td>
<td>96.2 % 97.2 %</td>
</tr>
<tr>
<td>DC01U1, DC01U2</td>
<td>1700 V</td>
<td>91.0 % 86.0 %</td>
</tr>
<tr>
<td>DC01V1, DC01V2</td>
<td>1700 V</td>
<td>87.8 % 90.0 %</td>
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<tr>
<td>DC04V1, DC04V2</td>
<td>1625 V</td>
<td>92.2 % 91.6 %</td>
</tr>
</tbody>
</table>

**Efficiency**

- Efficiency $\geq 90 \%$
- $85 \% < $Efficiency$ < 90 \%$
Eff = 94.0%

Eff = 93.5%

Eff = 94.0%
Eff = 91.6%

Lower Eff. Due to DC04V Anode HV tuning (leakage)

Eff = 92.3%
\[ \sigma_u = \sigma_v \approx 390 \, \mu m - \sigma_{\text{track}} \approx 250 \, \mu m = 300 \, \mu m \]

Idem DC04Y, DC04U and DC04V
Eff = 93.9%

Eff = 87.5%
**Eff = 96.4%**

**Eff = 96.3%**
DC00V1/V2

Eff = 92.2%

Eff = 92.3%
Residual vs \( u \)

\[
\sigma_u = \sigma_v \approx 380 \ \mu m - \sigma_{\text{track}} \approx 250 \ \mu m = 280 \ \mu m
\]

\( \sigma_{\text{position}} \) is OK - Idem DC00Y, DC00U and DC00V
DC01U1/U2

Eff = 92.4%

Eff = 87.3%
Residual vs $u$

Residual vs $v$

$\sigma_{U1_u} = \sigma_{U1_v} \sim 320 \mu m$  $\sigma_{U2_u} = \sigma_{U2_v} \sim 380 \mu m$

$\sigma_{\text{position}}$ is OK - Idem DC01X, DC01Y
Residual vs u

Residual vs v

u-resolution degraded due to shifted RT

DC01X/Y/V RT should be re-fitted

~ 1mm
DVCS run 2017 Status of Saclay DCs (by Charles J. Naim)

- DC04X/DC04Y/DC04U/DC04V All OK
- DC00X/DC00Y/DC00U/DC00V All OK
- DC01X/DC01Y/DC01U/DC01V Refit RTs