AD machine status

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Outline

• 2018 AD start-up and performance
• Machine issues
• Run statistics
• Plans for LS2
• Physics start delayed from 9/4 to 30/4 due to fire in the Horn power supply...

• Very short AD start-up:
  • First Pbars produced 19/4
  • Issues with Power converter controls upgrade (FGC3) and other minor problems
  • First signs of target cooling water leak
• Good deceleration efficiency and beam quality at 100MeV/c: absence of “halo”, Ibunch<200ns
• Physics start on 30/4 as (re-) planned

30/10/2018
Major machine issues (physics run)

- 15/6 – 22/6: HV flashover in Horn junction box/stripine (in Target Area). Replaced with spare unit.
- 23/7 – 17/8: Electron cooler cooling water leak inside collector vacuum chamber. Replaced with spare collector.
- 6/9 – 12/10: Spare collector also develops (smaller) leak....this time no spare is available:
  - A: Isolate and vacuum pump leaking circuit. HV tests ok but HV breakdowns when starting electron beam
  - B: Repair leak with liquid epoxy. HV tests ok and some cooling observed at 300 MeV/c but vacuum pressure builds up...
  - C: Install (recently) repaired original collector. Some HV issues at restart.
  - D: Design and build new collector to fit both existing and future e-cooler
- Until 12/10: Target cooling water leak:
  - Varying leak rate at first believed to be linked to proton beam intensity
  - System modified to air-cooled, works well with full beam intensity

30/10/2018

ADUC
AD statistics

- Running for physics since 2000, > 60000 physics hours realized, (no machine runs in 2005 & 2013):

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<tbody>
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<td>Beam available for physics (%)</td>
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<td>89</td>
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<td>Uptime AD machine (%)</td>
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<td>81</td>
<td>93</td>
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30/10/2018

ADUC
Ejected beam intensity 2018

For comparison – 2017:
Fault statistics
Outlook for LS2

• LS2 - heavy activities in AD machine & target area:
  • Major Target Area refurbishment after 30 years w/o major interventions: new target design & new horns including new re-designed trolleys, new ventilation building B196, new ventilation/cooling systems, magnet consolidation, infrastructure, decontamination etc.
  • Finalise most of AD machine consolidation:
    • Magnets: 70/50% of Ring Bendings/Quads will be completed in LS2
    • Power converters: Capacitor discharge elements to be gradually renewed
    • RF C10: Fabrication of new final stage triodes, “small” Low-level upgrade
    • RF C02: new cavity (PSB finemet prototype), new Low-level DSP system
    • Stochastic cooling: Transmission lines/amplifiers etc. needs removal and re-installation to access magnets below shielding
    • Electron cooling: Design/build new collector
    • BI: Consolidation of BCCCA Cryo system
  • And let’s not forget the experimental area...ELENA transfer lines (see F.Butins talk)