

PS status

H. Damerou on behalf of PS operations and supervisor team

Status of operational beams

| Fixed target beams | Status | Comment |
|---------------------|--|--------------------------------|
| EAST Irrad/North | Operational | |
| MTE | Operational at $1.6 \cdot 10^{13}$ ppp | Migrated to MHS on 17/08 |
| TOF | Operational | |
| AD | Operational | |
| EARLY Xe | Operational | Thursday/Friday on SPS request |
| EAST Irrad low int. | In preparation | Checked with MHS on 02/08 |

→ **~94% average beam availability during last 2 weeks**

Status of operational beams

| LHC-type beams | Status | Comment |
|------------------|-------------|--|
| LHCPROBE | Operational | Migrated to MHS on 11/08 |
| LHCINDIV | Operational | |
| LHC25 BCMS (48b) | Operational | Constant bucket area, 1.5 μm per plane at $6.4 \cdot 10^{13}$ ppp |
| LHC25 (12b, 72b) | Operational | High-intensity variants for MDs |
| LHC25 8b4e | Not in use | |
| LHC50 | Not in use | Requires RF setting-up at flat-top |

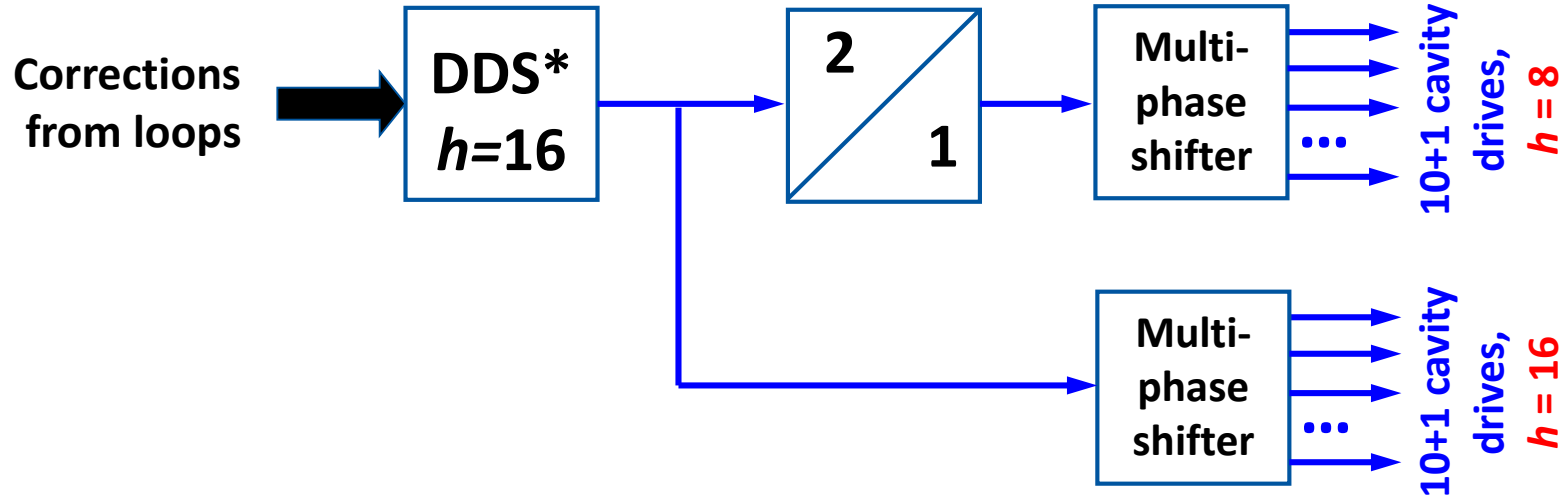
- Wire scanner 64V broken (now using 85V)

News from MDs

- White-Rabbit B-train tests and POPS regulation
 - **Observed drift at flat-bottom due to OASIS digitizer** perturbing field integrator
- Longitudinal beam stability with double-harmonic RF 10 MHz/40 MHz at flat-top
 - **Confirmed beneficial effect** as observed in 2016 in bunch-shortening mode
 - **Studies with 6 and 7 (full ring) bunches injected**
- Intensity of beam traversing 'ralentisseur'
 - **Only one turn with ralentisseur in**, beam lost due to energy decrease
- Delivery of high intensity LHC25ns beam for Q22 studies in SPS
 - **Good longitudinal quality** to $> 1.8 \cdot 10^{11}$ ppb with coupled-bunch feedback
- Space charge studies with LHC25ns, beta-beating, (mis-)steering at injection, 40 MHz phase feed-forward, etc.

RF beam control upgrades

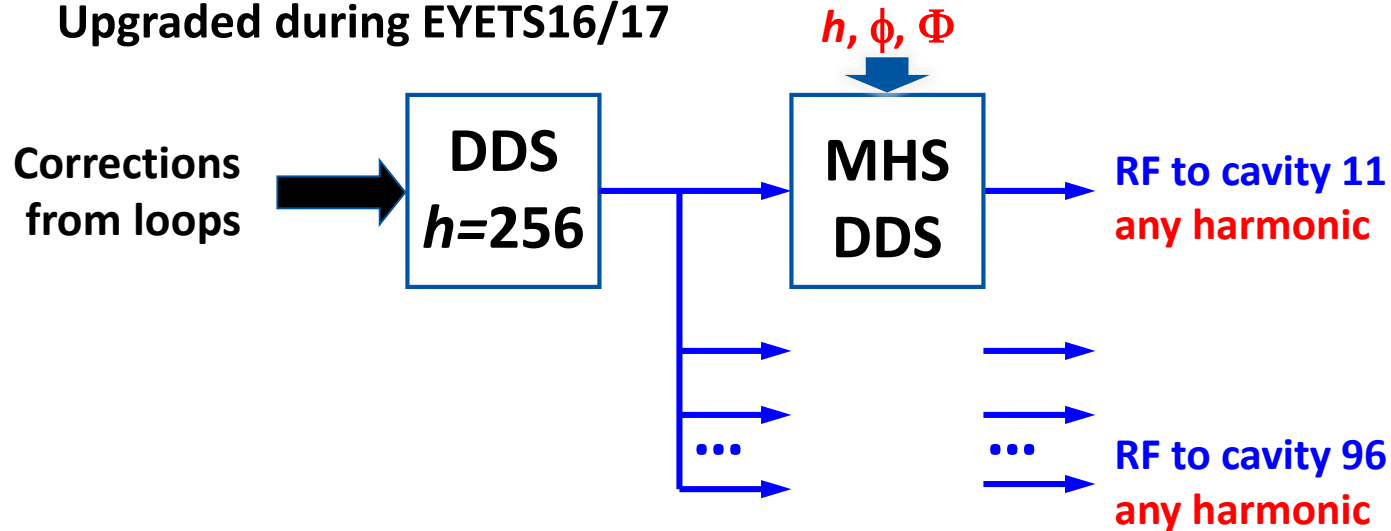
- 10 + 1 main accelerating ferrite-loaded cavities in PS
- Compensate time of flight such that field sums up for beam → **Dephasing**
- Fixed-target and EAST beams presently produced with **analogue dephasing**



*DDS: Direct Digital Synthesizer

RF beam control upgrades

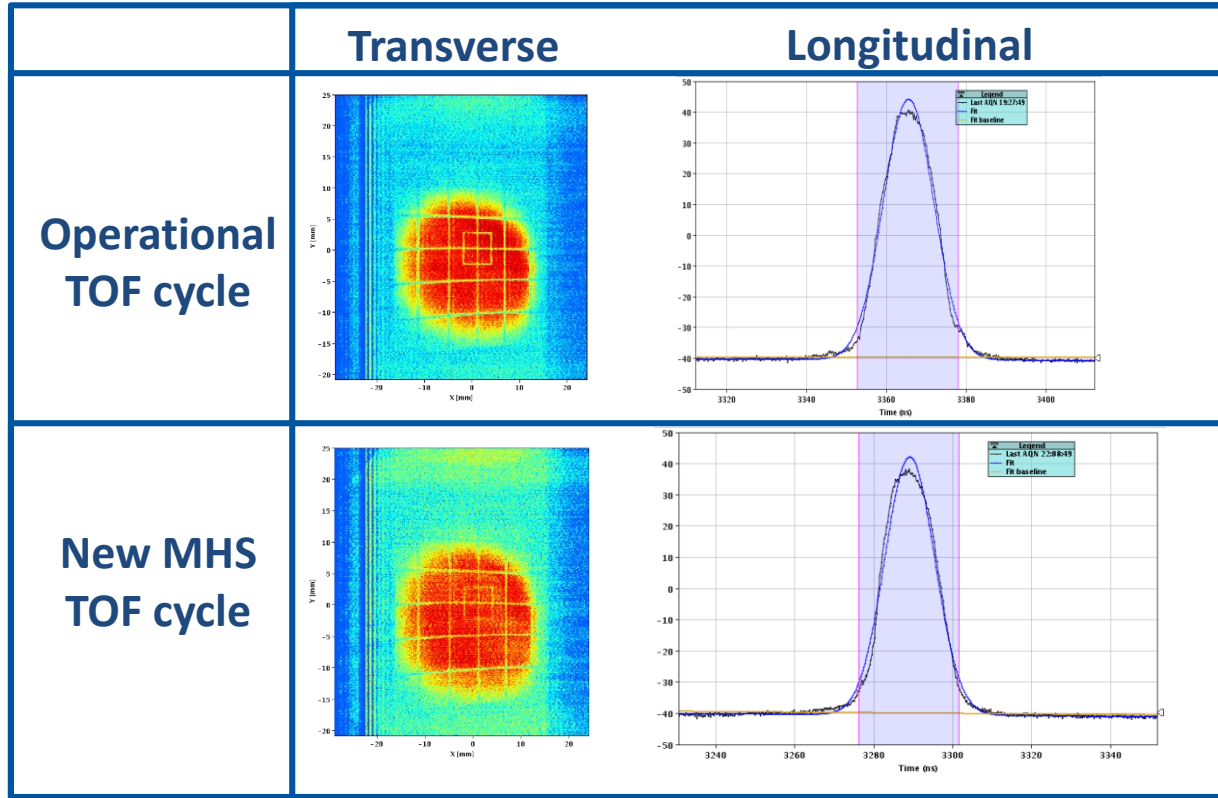
- Beams to AD and LHC: more flexible RF source system for dephasing
- Single, fully programmable multi-harmonic RF source per cavity (MHS)
- Upgraded during EYETS16/17



- Migrating all beams to MHS system, **only longitudinal settings** affected
- Recently done for LHC PROBE, LHC INDIV and MTE → **transparent**

Example: TOF

Comparison of operational TOF beam with new clone using MHS



- No measurable difference in beam parameters
- Migrate operational beams
- Accumulate experience

Migration of MD beams to MHS

- Beams using the **LHC and AD beam** control need **no change**
 - Already running with the MHS system
 - Clones of AD and all LHC-type multi-bunch beam variants
- Beams using the **h16LI and h8h16** beam control **need to be migrated**
 - Clones of LHCPROBE and LHCINDIV
 - Clones of SFTPRO/MTE, EAST, TOF
- Migration and check takes about **~1h per beam**
 - If possible: new clones for MDs from operational beams (“_MHS”)