

LEIR Status

- Aim of the LEIR run 2009:

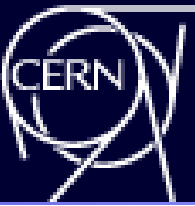
- ◆ Priority: Provide beam for testing upgraded SPS low level RF system for ions (with the “EARLY” beam, required for the first LHC ion run(s), and less demanding)
- ◆ Investigations on the Nominal LEIR ion beam ... not yet demonstrated!
- ◆ (not for I-LHC: partial INCA tests)

- Present Status

- ◆ Restart after a long (18 months!) shutdown
 - Many controls related (INCA test, new FESA classes, LSA development side effects ...)
 - Start with beam: relatively smooth
- ◆ EARLY LEIR beam: Provided with high reliability intensity low with $< 20\mu\text{A}$ from Linac3
 - Cycle accumulating 2 Linac shots never requested by PS & SPS
- ◆ NOMINAL LEIR beam:
 - Not yet obtained ... not only due to low Linac3 current ... losses at start of ramp since 2006
 - No significant progress so far this run



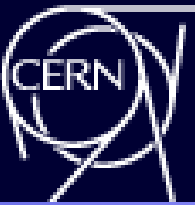
Some issues slowing progress on the Nominal beam down



Note: Thanks to all colleagues solving issues in general quickly and efficiently!

- INCA test (LEIR again used as test case!! ... makes sense since already partly controlled via LSA)
 - ◆ Initial settings (discrete parameters for USERS/Settings not yet used) an issue for long time
 - ◆ (Some clean-up and structuring of parameters in LSA wishful ... after the run)
- LSA issues (side effects of developments ... especially after 18 months LEIR shutdown)
 - ◆ LEIR specifics well understood by LSA team (and fast reaction in case of troubles)
 - ◆ Problems for generation of new 4.8 s cycles (made working in spring) again in September
- Low Linac3 beam current (up to $\sim 20 \mu\text{A}$ only)
 - ◆ Longer “normal cycles” ... 4.8 s cycle started (for investigations, not for LHC filling)
 - ◆ Use of long plateaus (special LEIR mode with similarities to SPS coast)
- Completion of low level RF system (big effort during most of the run 2009)
 - ◆ Implementation of cavity servo loop and double harmonic
 - ◆ Proper integration into control system (many, sometimes recurrent, problems):
 - Programming via LSA/INCA (functions and knobs), observation via OASIS
- Considerations for Users, impact from other machines
 - ◆ New cycles (above 4.8s cycle) not put in supercycle to avoid perturbations
 - ◆ In practice, no beam in LEIR during PS problems (see proton inj. septum exchange last week)

Summary



- LEIR is an operational machine
 - ◆ Providing the EARLY LHC ion beam reliably
 - ◆ But the NOMINAL beam has not yet been demonstrated ... not only due to low Linac3 beam current, but also due to losses on ramp in LEIR!
 - ◆ “Not just an installation for testing”
- Importance to have time to study machine and beam dynamics issues
 - ◆ Without considerations on users of the beam
 - ◆ Hopefully in a state allowing efficient work
 - ◆ Better understand limitations for nominal beam now (if possible)
- Request to continue working during week (after completion of ion induced desorption measurements)
 - ◆ NOMINAL beam!! ... as much as possible with available Linac3 beam
 - ◆ A few other investigations: completion of low level RF tests, Tomoscope with double harmonic RF, reference measurements, vacuum with ejection without bump)