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Night shift Feb 5th

The night before the simulator had been validated with ACC67 at lower gradients to avoid LFD. Due to energy acceptance today we had to work with ACC67 at 276.5 MeV. The first operation was to import new data into the simulator and validate the model at this gradient.

The plan for the shift was to measure cavity tilts generated by beamloading and compensate them by adjusting cavity QL's. The measuring and compensation procedure was as follows:

- Measure the tilt with feedback and beam ON.
- Fit data into the simulator and calculate the appropriate Ql for flat gradient with beam.
- Turn beam OFF.
- Adjust Ql.
- Slightly adjust cavity tuning if needed.
- Turn feedback and beam back ON.
- Verify tilt.

The procedure was done by adjusting one cavity at a time. Later 2 cavities at a time. The goal was to achieve all tilts below ±1%.

When we started we had several cavities with tilts between ± 2 and 6%. At the end all cavities had tilts below ±1%.

Since the beamloding is only 1.5mA during 400us, sometimes it was hard to see the improvement until the cavity was slightly retuned.

Findings:

The approach was validated and seems viable for flattening individual cavities under heavier beamloadings up to something like 6mA.

Maintaining tilts below 1% will depend on how much cavities detuned over time and other drifts.

The machine restored the initial state: transmission 400 bunches, 15.nC.