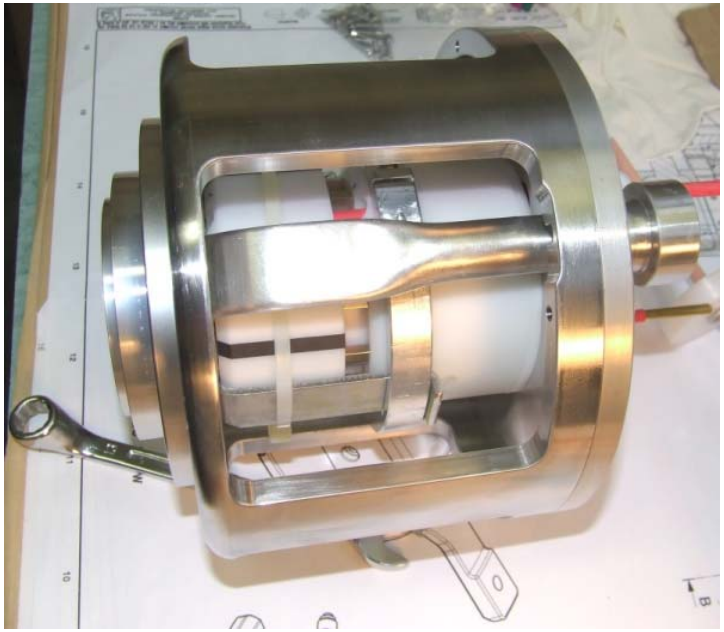
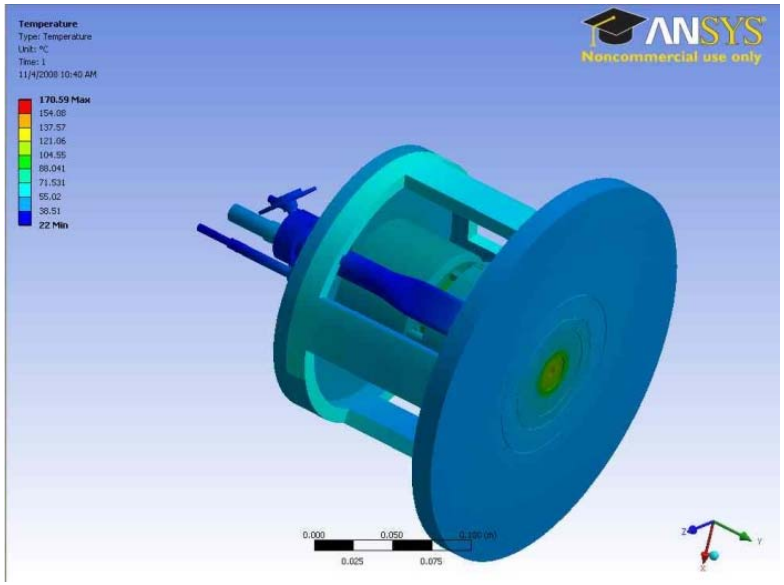
SLHC-PP – Work Package 7

- Task 7.1
- Deliverable 7.1.1 – Due M12 – Report
- Thermal modeling of the Linac 4 source at the duty factor for SPL operation
- Used ANSYS on the Catia model (with simplifications).
- Model shows that the PE surrounding of the source and lack of active cooling leads to extreme temperatures in the source.
- Electrodes in the extraction region are a challenge (not easy to cool).
- Study for the deliverable mostly completed.
- Report being written.
- Work on milestone 7.1.1 has begun. (Material changes and cooling among other modifications).

Linac 4 source –
Almost assembled.

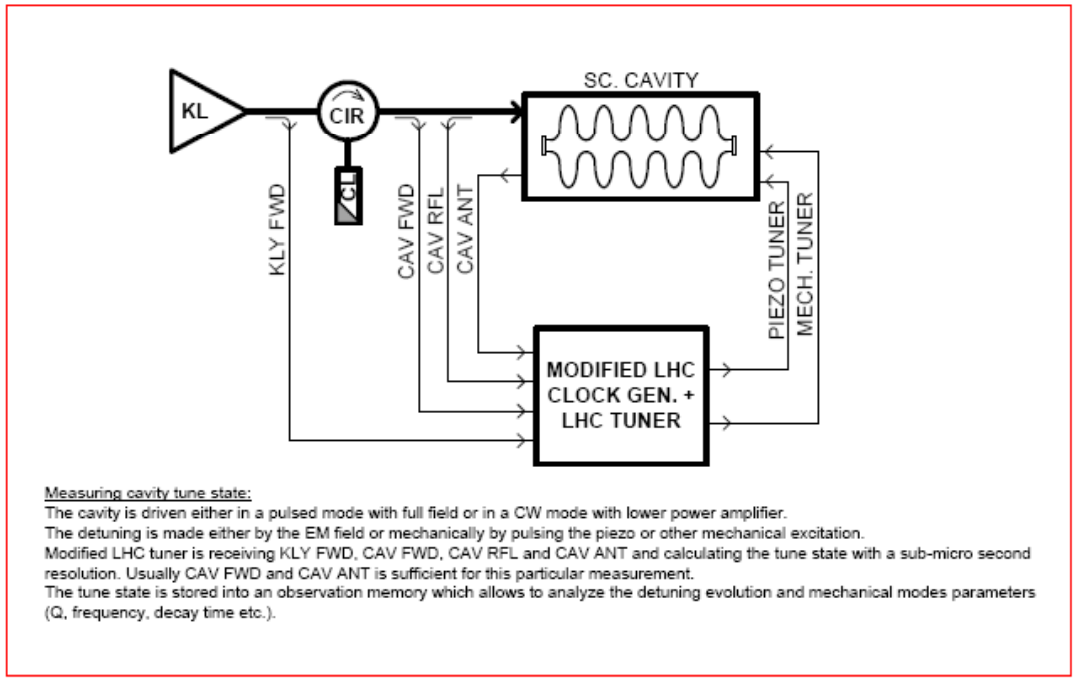




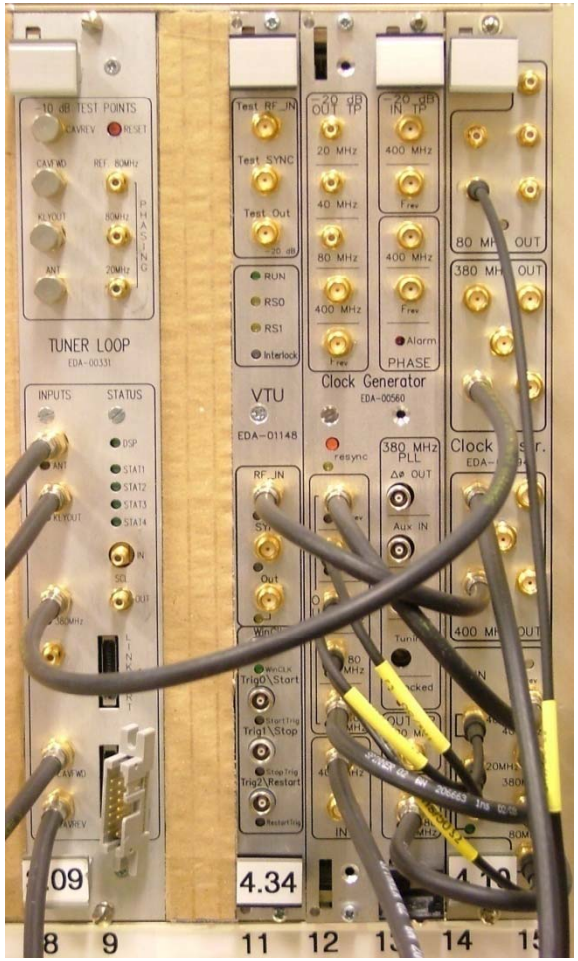
Thermal simulation
of the source (low duty factor)

- Task 7.2
- Deliverable 7.2.1 – Due M12 – Report
- In depth characterisation of the two tuners plus cavities developed in the frame of the HIPPI JRA (FP6).
- Visits to CEA to discuss the modalities.
- Saclay cavity and tuner are being assembled and will be cooled down soon.
- Measurements (at high power, 50Hz) will then made in the 1st quarter of 2009 (after commissioning couplers to 1MW).
- INFN cavity will be delivered to Saclay in 2008, there are some technical issues to solve before making these measurements.

- Use modified LHC low level RF to control the Saclay RF system at 704MHz.



Measuring cavity tune state:
The cavity is driven either in a pulsed mode with full field or in a CW mode with lower power amplifier.
The detuning is made either by the EM field or mechanically by pulsing the piezo or other mechanical excitation.
Modified LHC tuner is receiving KLY FWD, CAV FWD, CAV RFL and CAV ANT and calculating the tune state with a sub-micro second resolution. Usually CAV FWD and CAV ANT is sufficient for this particular measurement.
The tune state is stored into an observation memory which allows to analyze the detuning evolution and mechanical modes parameters (Q, frequency, decay time etc.).



- Budgets:
- Staff: So far about 53% of 2008 manpower has been charged to time sheets.
- Fellows: Have arrived later, costing correct.

=> ~100kchf of fellow allocation will not be used.
T7.2 to transfer 70kchf to travel and material.
The remaining to be allocated later.

- Travel: About correct.
- Material: T7.1 Software purchase was not necessary.

Money will be used for RF generator building.