The Dec11 Run

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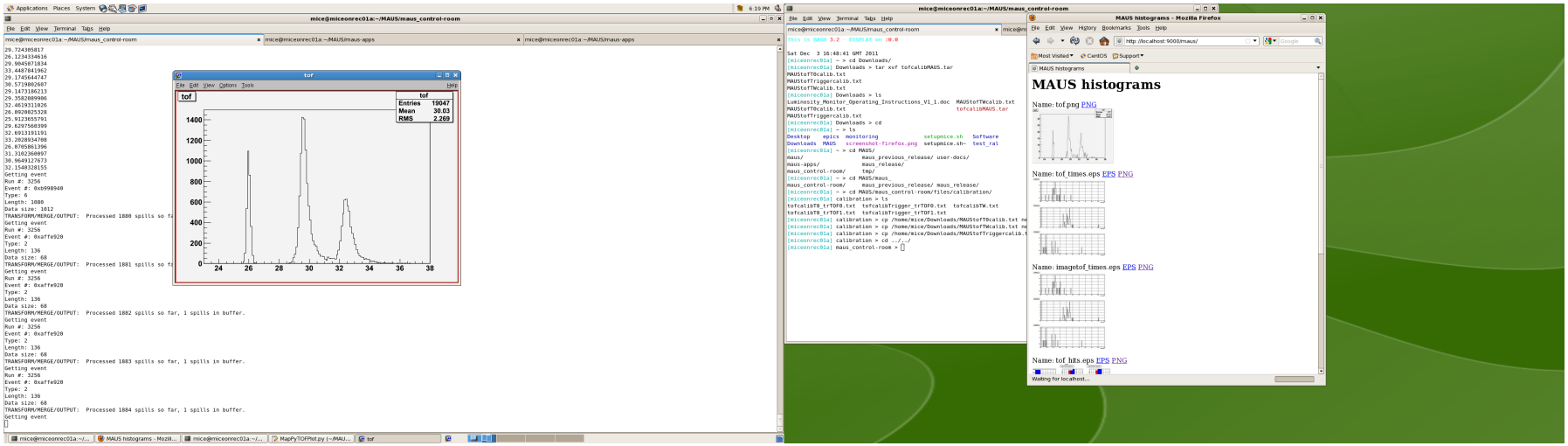
MAUS runs online and in parallel in MLCR

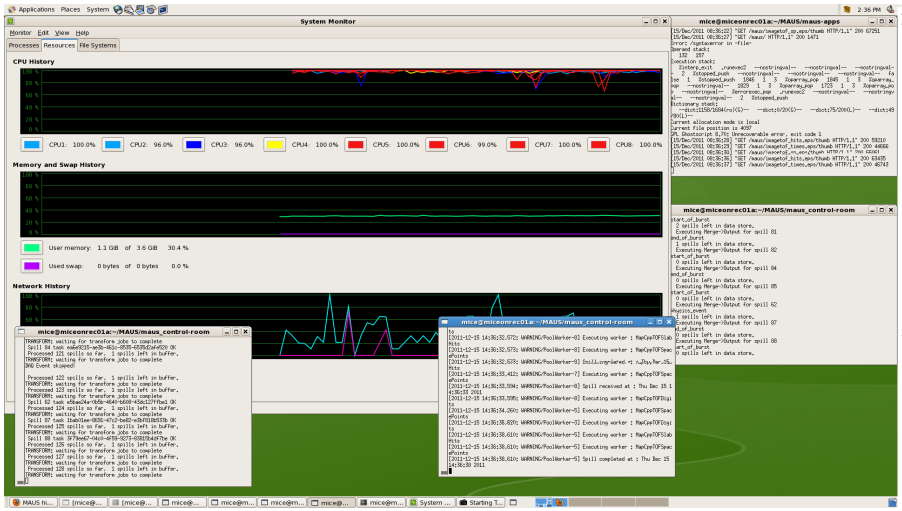
The beginning - last week of November.

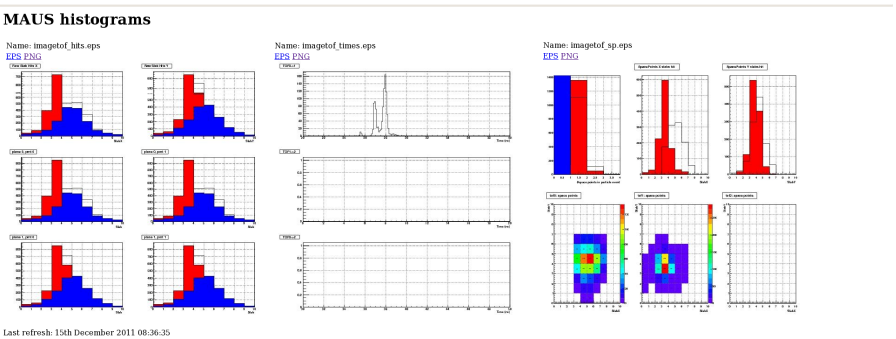
MAUS has been used online in MLCR even before the official beginning of the data-taking campaign.



MAUS runs online and in parallel in MLCR

Now





- Some minor modifications are still needed, in order to make MAUS Online Reconstruction really useful for the shifters in MLCR.

New TOF calibration

TOF calibration data:

Runs	Description	amount of data
3245, 3248, 3247, 3248	pi+, 272 MeV/c at D2; Defocused beam for TOF calibration; Decay Solenoid is OFF;	~4500 target pulses
3251	pi+, 272 MeV/c at D2; Decay Solenoid is OFF	~ 400 target pulses
3511	pi+, 148 MeV/c at D2; Defocussed positron beam for TOF2 calibration; Decay Solenoid is ON.	~1200 target pulses

Time resolutions:

- TOF0 : 55 ps
- TOF1 : 53 ps
- TOF2 : 50 ps

We have ~ 10 *ps* improvement in the resolution of TOF1 after the refurbished of the detector.
More details about the new TOF calibration in Durga's talk.

Data for π background and Ckov studies.

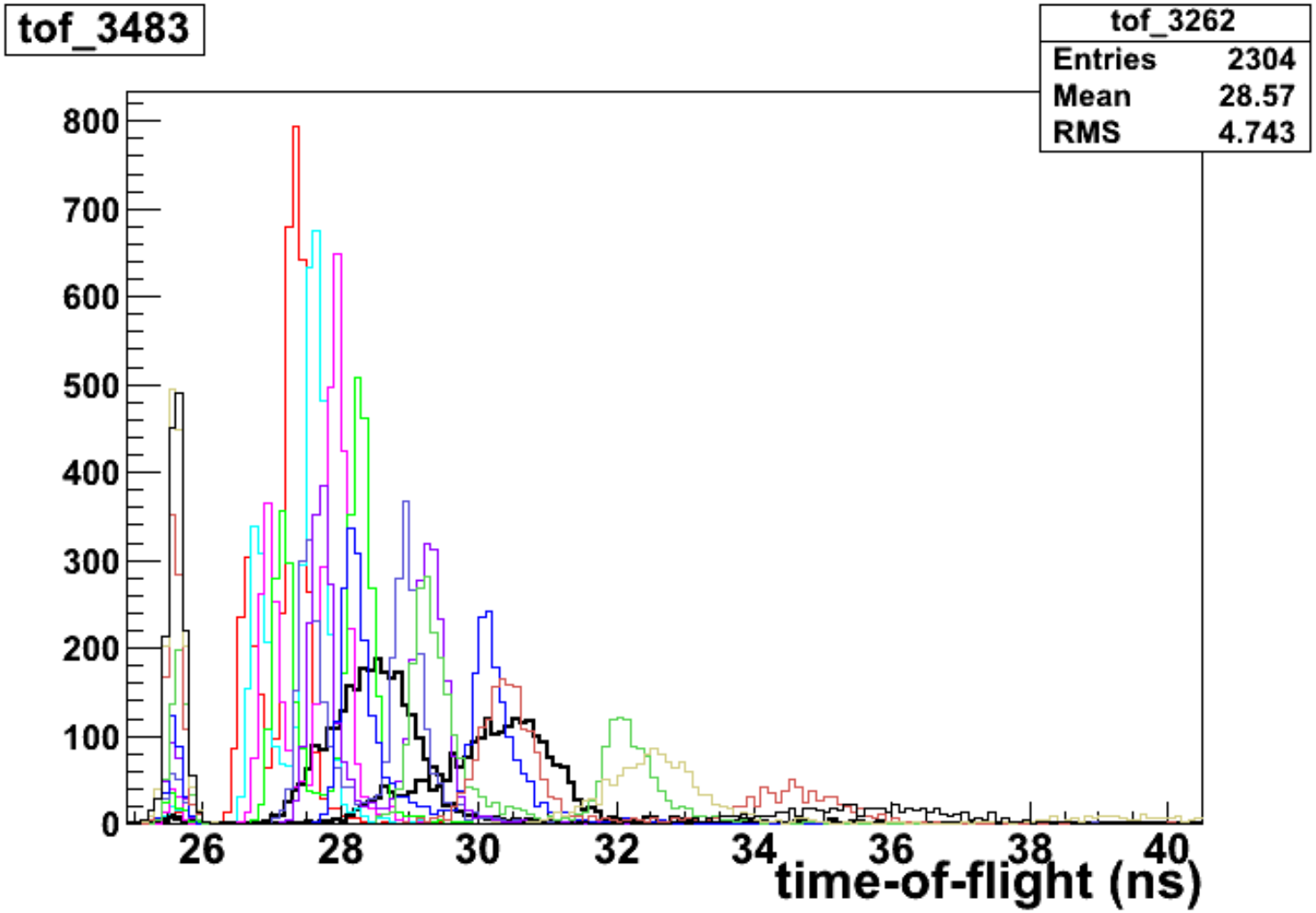
"Pion" beam mode:

Runs	Description	amount of data
3262, 3263	pi+, 148 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~4000 target pulses
3264, 3265	pi+, 168 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~4000 target pulses
3373, 3375, 3376, 3377	pi+, 195 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~4200 target pulses
3379, 3380, 3383, 3386	pi+, 222 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~4000 target pulses
3255, 3256	pi+, 222 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is OFF.	~3300 target pulses
3249, 3250, 3252	pi+, 258 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is OFF.	~3100 target pulses
3454, 3455,3456	pi+, 280 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is OFF.	~4100 target pulses
3253, 3254	pi+, 294 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is OFF.	~4500 target pulses
3504, 3505	pi+, 310 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~3800 target pulses
3261	pi+, 320 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~2200 target pulses
3423, 3424, 3457	pi+, 341 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~4500 target pulses
3426, 2427	pi+, 362 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is OFF.	~4000 target pulses
3483, 3484, 3485, 3486, 3501, 3503	pi+, 388 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~4300 target pulses
3487, 3488	pi+, 423 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~2400 target pulses
3489	pi+, 450 MeV/c at D2; Momentum scan in pion beam mode; Decay Solenoid is ON.	~1900 target pulses

"Pion/muon" beam mode:

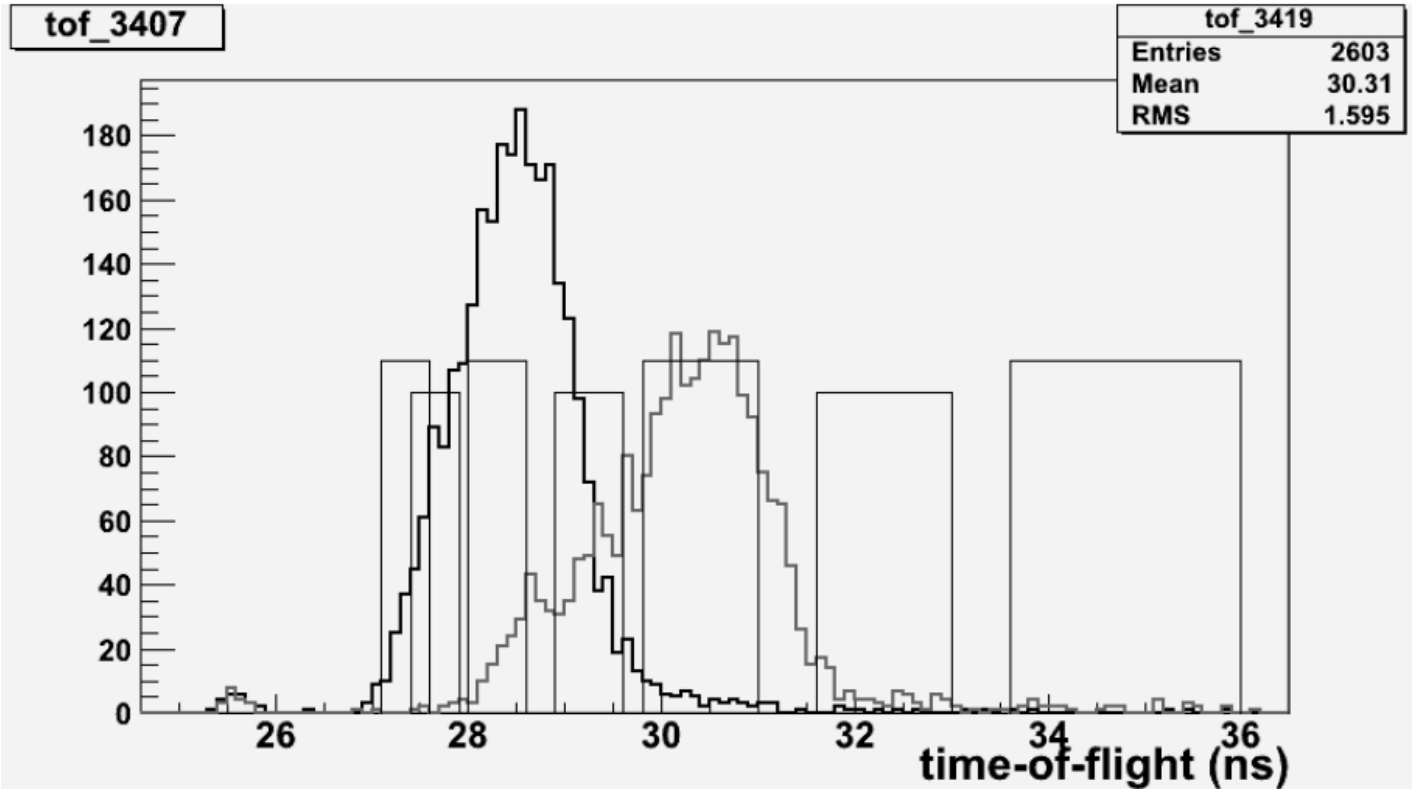
Runs	Description	amount of data
3401, 3407, 3506, 3507, 3509	pi/mu+, nominal, ref., 237 MeV/c at D2; Pion background study; Decay Solenoid is ON.	~5000 target pulses
3419, 3420, 3495, 3497,3499	pi/mu+, 189 MeV/c at D2; Pion background study; Decay Solenoid is ON.	~7300 target pulses

Data for π background and Ckov studies.



The momentum scan in "pion" beam mode has been completed.

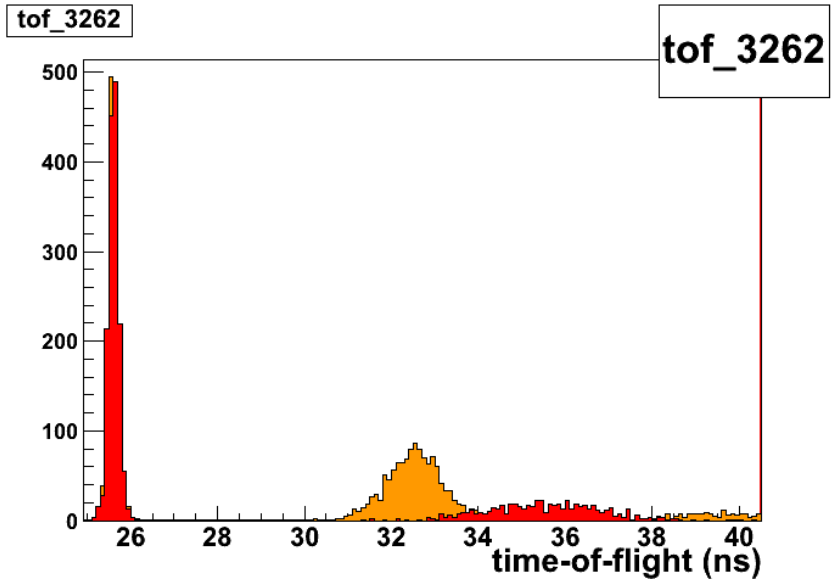
TOF data for π background study.



- The accumulated data gives good coverage in the range between 27 and 36 ns in the time-of-flight spectrum.
- First results about the pion contamination in the pion/muon beam in Marian's talk.

e^+e^- puzzle.

Very low momentum positive pion beams are dominated by e^+.



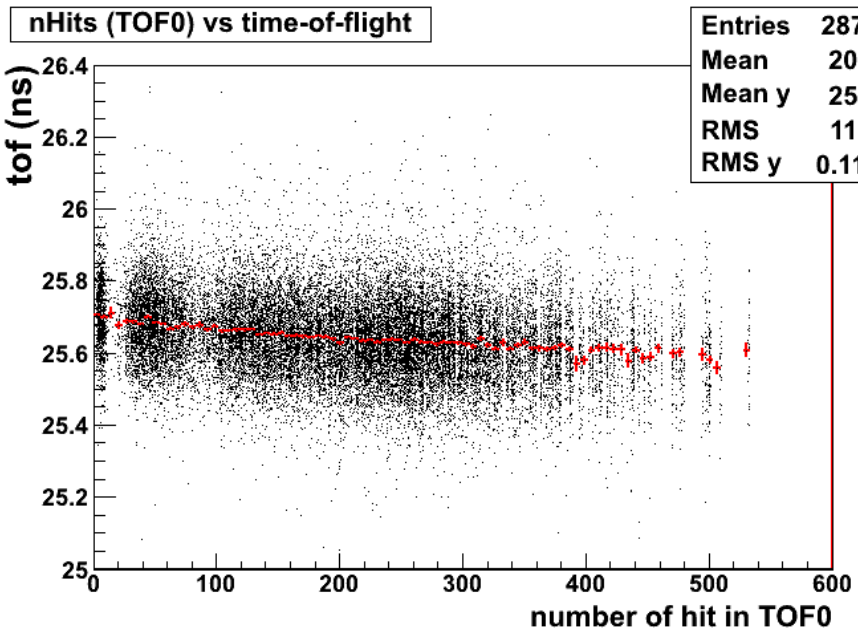
- "pion" beam mode - 148 MeV/c (in D2).
- "pion" beam mode - 168 MeV/c (in D2).

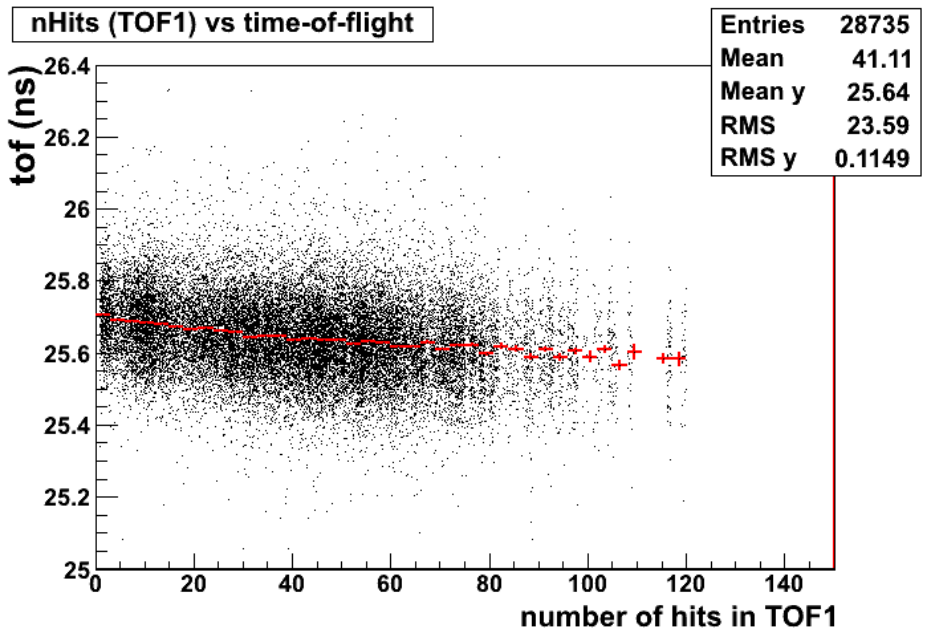
This is a good opportunity to study the time-of-flight of the positrons.

	Rate effect study	
3411	pi+, 148 MeV/c at D2, very low trigger rate; Rate effect study; Decay Solenoid is ON.	~1500 target pulses
3413, 3414	pi+, 168 MeV/c at D2, very low trigger rate; Rate effect study; Decay Solenoid is ON.	~1300 target pulses
3492	pi+, 148 MeV/c at D2, trigger rate between 1 and 70; Rate effect study; Decay Solenoid is ON.	~4100 target pulses

e^+e^- puzzle.

- Run 3492 - $\pi+, 148\ MeV/c$ at D2, trigger rate between 1 and 70;
- Correlation between time-of-flight of the positrons and the event rates in TOF0 and TOF1 has been observed.





- The variation of the number of particle trigger per spill introduces difference in the measured time-of-flight ($\sim 100\ ps$).

Decay Solenoid study

The DS has been run with reversed polarity.

Runs	Description	amount of data
3512, 3513, 3514, 3515, 3516	pi/mu-, nominal, ref., 237 MeV/c at D2; Negative beam polarity; Decay Solenoid is ON.	~5000 target pulses
3537, 3539	pi/mu+, nominal, ref., 237 MeV/c at D2; inverted DS polarity, positive beam polarity; Decay Solenoid is ON.	~2200 target pulses
3545, 3547	pi/mu-, nominal, ref., 237 MeV/c at D2; inverted DS polarity, negative beam polarity; Decay Solenoid is ON.	~2500 target pulses

- Does this affect the number of good muons we get?
- Does this affect the time-of-flight of the electrons/positrons?

Volunteer is needed for this analysis.

Conclusions

- Very successful data taking campaign!
- More than 250 GB of data has been taken.
- MAUS was runing online in MLCR.
- The momentum scan in "pion beam" mode has been completed.
- The e^+e^- puzzle seems to be solved.