TOTEM

ORGANIZATION

SHEETS

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TOTEM Analysis & Physics groups co-operation

We believe the best strategy is to define the interfaces and the intersections of the working activity of the two groups (rather than defining boundaries).

**Analysis – oriented works:**

Analysis algorithms, including re-reconstruction / re-fitting of tracks and vertexes.

Analysis procedures, including data selection/tagging, cuts efficiency/purity, acceptance/efficiency corrections, normalization.

Final physics observables/measurements and related systematics.

**Physics – oriented works:**

Papers survey and relevant literature in the domain of TOTEM publications.

Study and comparison of physics models and data, including MonteCarlo for TOTEM physics channels.

Final physics observables/measurements and related systematics.

**Common works:**

In addition to working together on the interpretation of the physics observables/measurements produced by the analysis of the data, we propose to:

Contribute to the preparation/refereeing of physics plots and papers.

Make joint meetings with a given time-regularity to allow easier participation for not CERN-resident people.

TOTEM Software & Analysis groups co-operation

We believe the intersection and feedback loop between the software and analysis programming should follow the standard HEP approach, which consists in the following:

**Software – oriented programming:**

Geometric modelling and alignment; LHC optics modelling; MC generators and detector simulation; Reconstruction; Data reading; Event-display; Trigger simulations and data quality monitoring; Offline databases (including calibration, etc.).

Production of DSTs and mini-DSTs (“reco & analysis objects” in the CMS framework vocabulary).

**Analysis – oriented programming:**

Analysis algorithms, including re-reconstruction / re-fitting of tracks and vertexes.

Systematic availability and re-integration of developed algorithms into software mainstream.

Feedback loop on DST and mini-DST definition.

**Common works:**

We agreed and intend to work together on the:

Validation software processes and code management, in order to allow concurrent and consistent development for algorithms and modules.

Configuration management of software, analysis and production releases (to guarantee consistency and traceability of produced and archived runs, for all physics, simulation, and detectors data).

Make joint meetings with a given time-regularity to allow easier participation for not CERN-resident people.

TOTEM Physics & Software groups co-operation

We believe the intersection and feedback loop between the software and physics activities should also be emphasized for some key areas (the software-specific and physics-specific, respectively, areas of work are already treated in the previous two sheets):

**Common works:**

We agreed and intend to work together on the:

* MonteCarlo programs
* MonteCarlo productions
* LHC optics design studies (item 3 of TOTEM Optics sheet)

Joint meetings on such common subjects will be organized with a given time-regularity to allow easier participation for not CERN-resident people.

TOTEM Detector Performance

The detector performance has to be considered in its full scope, from the analysis-oriented quantities (resolution, efficiency), to online and offline software-oriented functionality (monitoring, data quality, reference histograms), to hardware-oriented issues (radiation damage, etc.), to run and technical coordination requirements.

Consequently we believe that a general meeting should be organized monthly with all parties involved being represented, including physics, analysis, software and run coordinators. In addition, a responsible person per detector/project is appointed:

* RP (G.Ruggiero)
* T1 (F.Ferro)
* T2 (E.Olivieri)
* Trigger (N.Turini)

Given the general scope of such dedicated meetings, they will be convened by the spokesperson or the technical coordinator.

Specific detector/trigger issues will be forwarded and handled in the individual detector/trigger projects listed above. The corresponding coordinators are responsible to organize and run regular weekly meetings.

TOTEM Optics

The work related to the LHC parameters and optics involves at least three major domains of study:

1. Understanding of the “experimental” LHC optics determining the proton transport function in the LHC lattice up to the RP stations. This is the machine optics “as it was” during each data taking, affecting the data being analysed and to be published. The issue is to understand all optics effects determining an impact onto the physics data analysis and measured physics observables in the detectors. Therefore this activity is part of the Analysis. H.Niewiadomski will be in charge of this Optics domain and of the related interfaces/contacts with the accelerator. He will also be in charge to release the corrected optics models into the software in order to run uptodate simulation production.
2. Assessment of the machine development time and LHC physics beam time to set the TOTEM runs and data taking in the most convenient scenarios for TOTEM physics. This involves optimization of bunch-structure configurations, beam intensity, RP positions, etc. This activity is under the control of the Run coordination and is managed by M.Deile. The interface and feedback to/from the Analysis is guaranteed by the mutual attendance at Analysis and Run meetings by the relevant people.
3. Study of the optics configurations for the following runs, necessary to fulfil the TOTEM physics programme, e.g. for the precision-measurement of the total cross-section. These studies have to take into account beam energy, luminosity and accelerator parameters to optimize the physics performance of the experiment. Example: \* 90m or any new optics. The responsibility for the new optics design activities (and interfaces/contacts with the accelerator) will be assigned to V.Avati and will be performed in close collaboration with the Physics group.

The convenors of the three optics domains should organize together the optics-related meetings with the accelerator contact-persons.

TOTEM meetings

The regular periodic meetings concerning all TOTEM activities will be organized according to the following model:

Monday (weekly): Technical Board

Monday (weekly): Online&Firmware

Tuesday (weekly): Run meetings

Tuesday (weekly): DCS

Wednesday (every-two-weeks): Analysis

Wednesday (monthly): joint Physics-Analysis

Wednesday (monthly): joint Analysis-Software

Thursday (every-two-weeks): Software

Thursday (monthly): joint Physics-Software

Thursday (monthly): Physics

Friday (weekly): Detectors/Trigger performance specific meetings

Friday (monthly): General Detector/Trigger performance