

Converging on funding for the ITk Pixel detector before the submission of the TDR at the end of 2017

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Goal

In this document we discuss a framework and timetable for converging on the division of funding of the ITk Pixel detector between the different funding agencies contributing to the total cost ahead of the submission of the Pixel TDR to the LHCC/UCG at the end of 2017.

Introduction

The problem of the mismatch between the required CORE funding for the ITk Pixel detector and the sum of the aspirations of the individual funding agencies is something that has been with us for more than a year. The problem is sufficiently large that it requires co-ordinated action. A bottom-up attempt to resolve the oversubscription (~60MCHF aspirations for a 41 MCHF project) by presenting the problem to the FA contacts and appealing to them to reduce did not do nearly enough to resolve the problem. The FA contacts (*the physicist responsible for negotiations about ITk funding, the management of the ITk does not talk to FAs directly*) have found it difficult to reduce their aspirations to match the requirements. Recently, ATLAS management have given the individual FA contacts guidance on the *target share* that they should consider contributing to ITk Pixels. However, even when the guidance is accepted the individual FA teams are still operating in isolation and additional guidance and/or iterations will be required to approach complete financial coverage of the Pixel project on the timescale of the submission of the TDR. It should be clear that the convergence cannot be left to “chance” but must be guided through a process. Below we present a proposal for a stepwise framework on a well-defined timetable to help this process reach the required conclusion. The process is constructed to reach convergence by a combination of top-down and bottom-up iteration towards the required total target value, respecting the target shares of the individual FAs. It is understood that this cannot result in the ultimate, final CORE cost sharing in the sense that the process will only be really complete on the timescale of the preparation of the MOUs (2019) when the costs are understood and the FA contacts will have a more complete picture of the available funds.

Step 0:

Discussion of the proposed process (this document) during the ITk -Institute Board meeting during the March 2017 Upgrade week

Step 1:

Pixel and ITk management will take as a starting point the spread-sheet submissions from the individual FA contacts to the last round of data collection and the level on target share indicated by ATLAS management. From these submissions and the current knowledge of the costs of the detector a new set of spread-sheets are created and sent back to the funding agency contacts as guidance for the next step. The guidance will be constructed to:

- respect, as far as reasonably possible, the interests of the individual funding agencies have expressed in their original submissions. This information can be inferred from the original spread sheets and any new information that has come to light since then in point-to-point discussions.
- make sure that the total core cost for a given FA will not violate the target share value which is now, and in future steps, used as a ceiling.
- make sure that all areas of the baseline project are covered including those that were under subscribed in the original submission.

The spread sheets are circulated to the FA contacts in the first few days of April 2017.

Step 2.

The FA contacts are asked to use the guidance as the starting point for internal discussions ahead of a new submission (in the same spread sheet format) to ITk and Pixel management. At this stage all memory of the original submissions is lost. The total core value in the new submissions from an individual FA cannot be allowed to exceed the guidance given by ATLAS management.

In the last year significant progress has been made in the understanding of the division of responsibilities for the construction of the detector. The production of pixel modules will be a distributed task and the individual production sites contribute to a common pool of pixel modules. However, loading is a more specialized process. It is understood that the UK and Italy will contribute to the loading and integration of the pixel end-caps. For the barrel the discussion of the division of responsibilities is still in progress. One possible division is that the inner layers of the barrel will be constructed and loaded in the US while the outer layers will be constructed by Germany, Switzerland, France and CERN.. We would strongly encourage the contacts of these countries to talk to one another during the iterative process.

All submissions are to be received by ITk and pixel management by 1st June 2017. These should be sent directly to P. Morettini and S. McMahon.

Step 3:

Pixel and ITk management use the inputs returned from the individual funding agencies to construct a new Pixel money matrix.

At this stage the starting picture of required funds may have changed as we will have more information about:

- The baseline layout of the detector that will be submitted as part of the TDR.
- Costs of individual components

Based on the new submissions, conversations with the FA contacts that help understand constraints and new costings we will then be able to refine the picture of the coverage of the individual parts and where additional changes will be necessary. This picture can be discussed in a round table session during the ITk-IB during the June ITk week and used as a basis for the next stage of iteration.

Step 4:

New refined guidance, based on the Institute Board discussions, will be circulated to the funding agency contacts in the first few days of July.

Step 5:

The FA contacts are asked to return a second submission of their aspirations for the construction of a new money pixel matrix before 1st September.

Step 6:

A discussion of the new complete picture would then take place with all interested parties during the September ITk Week, Institutes Board meeting.

Step 7

Conversations with the individual FA contacts and ATLAS management will continue in September, October and the start of November and a new refined picture will be presented to the ITk - IB during ATLAS upgrade week between 13th and 17th November. This picture will be used to construct the input to the confidential material that will be submitted with the TDR.

The timetable for the process would now be as follows.

Step	When	What
0	29 th March (Upgrade Week)	Discussion of refinement process during ITk-IB
1	2 nd April	Circulation of spread sheets with starting guidance on core deliverables based on original submission and target share contribution as a total.
2	1 st June	Deadline to receive the new aspiration spread sheets. Construct the complete Pixel Money Matrix and discussion with ATLAS management
3	28 th June (ITK Week 1)	Present first new picture of the Pixel Money matrix to Institute Board. Discuss any new information on layout and updated costings to ITk-IB. Round table discussion of what the new guidance will look like.
4	First days of July	Recirculation of new guidance spread sheets as a response to new costing and round table discussion
5	1 st September	Receive second aspiration sheets and construction of new money matrix and discussion with ATLAS management.
6	20 th September (ITK Week 2)	Discussion of second round of submissions during ITk week Institute board.
7	16 th November	Presentation of up to date money matrix and provisional agreement ahead of preparation of confidential material for TDR