

# Beam test preparation note for the Neutral Pion TFF experiment

pi0 TFF collaboration

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This note describes the goals, necessary equipment and beam time, and preparation procedure for the pi0 TFF experiment beam test.

## 1 Introduction

The main goal of the pi0 TFF experiment beam test is to record a short data sample suitable for the trigger rate extraction and background conditions estimation. This data will allow us to optimize the trigger thresholds for the main run, and to measure experimentally background loads in the calorimeter and GEM detectors. We will use an opportunity to run right after X-17 search experiment "back-to-back", using their energy calibration, and calorimeter gain equilazition procedure.

## 2 Test run conditions

Some modification are still needed:  
electron beam energy needs to be increased to  $\sim 10.5$  GeV;  
new  $250 \mu m$  target needs to be installed at  $\sim 5.6$  m distance to HyCal crystals face;  
new wide tungsten absorber needs to be installed in front of HyCal;  
random and/or two clusters trigger needs to be set up;  
HyCal light monitoring system needs to be used for the possible crystal degradation during the run measurement;  
The most inner layer of crystals needs to be switched off.

## 3 Tungsten absorber fabrication parameters

(drawings, tungsten alloy parameters)

## **4 Silicon target**

(purity, thickness uniformity and measurements)

## **5 The trigger**

(random, existing X-17?)

## **6 Preparation and beam time**

## **7 Parameters to be extracted from the data**

(trigger rate, calorimeter load, GEM rates)