

PACMAN : technical objectives

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Subject 1.1



Non-contact high precision sensor for Leitz Infinity Coordinate Measuring Machine

Characterization of the stretched wire

Requirements

Feb. 15

Requirements

March 15

Characterization

Nov. 15

Compatibility of the measurement head with magnetic fields

Method & means to measure the stretched wire

Impact shown

ok

Requirements

Characterization on accuracy

July 16

Study of sensors

Oct. 15

Qualification

Nov. 15

Integration, acquisition, calibration, software, etc.

Feb. 16

Qualification on the Leitz CMM at CERN.

June 16

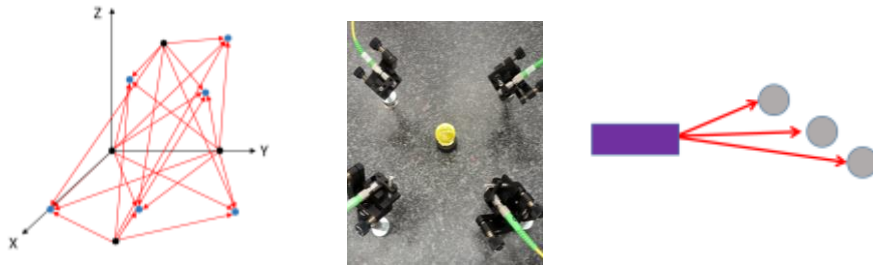
Measurements on the PACMAN validation bench

July 16

Subject 1.2

Development and validation of an absolute Frequency Scanning Interferometry FSI network

Upgrade of the system



Inter-comparison with
 μ -triangulation

Jan. 16

Preparation of the network
for PACMAN

How to detect the wire?

Network configurations

Design of network

Qualification

Measurements on the PACMAN validation bench

Extrapolation to a portable solution

Subject 1.3

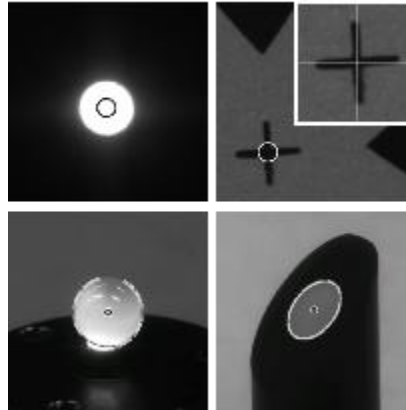
Micro-triangulation for high accuracy short range measurements of dynamic objects

Upgrade of the system

Control several instruments Apr 15

Enhance Auto-Focus Mai 15

Automatize exposure time Jun 15



Adaptation to the PACMAN project

Test new FSI targets Jul 15

Detect the stretched wire Sept 15

Simulate configuration Nov 15

Inter-comparison with FSI

Jan 16

Measurements on the PACMAN bench

Aug 16

Extrapolation to a portable solution

Dec 16

Improve GUI

Improve connectivity

Test Leica TS50

Subject 2.1

Stretched wire systems for the magnetic measurements of small aperture magnets

Improvement/refinement of
the wire based methods

Comparison between classic &
oscillating stretched wire methods

Analysis of uncertainties

May 15

Adaptation to the
PACMAN project

Requirements for PACMAN

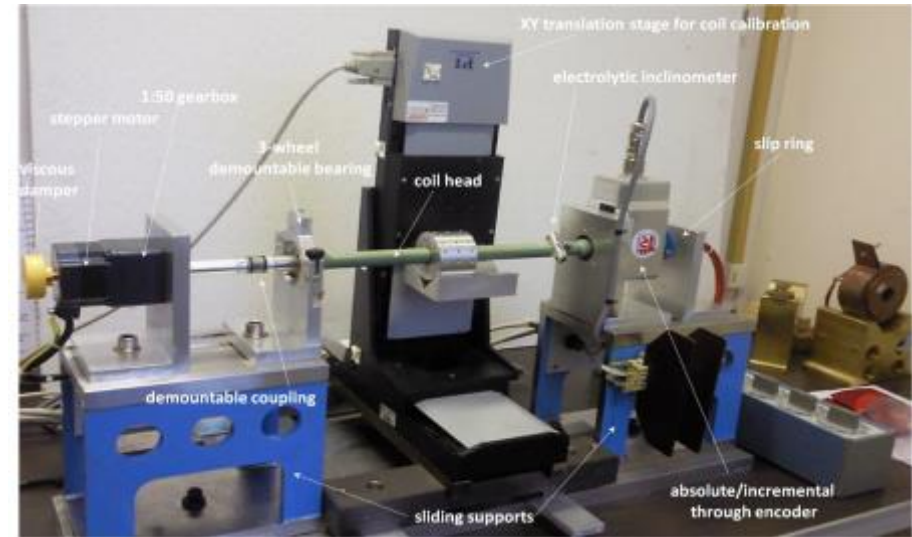
Determination of the
position of the wire
Design of a bench
for PACMAN

Inter-comparison with
PCB rotating coil bench

Measurements on the PACMAN validation bench

Subject 2.2

PCB technology for small diameter field probes



March 15

Status of current bench
Study of sensing coils

Hardware & software
improvements for a mini
PCB rotating coil bench

Determination of metrological
improvements

Development of a
PCB rotating coil

Inter-comparison with the stretched wire method

Subject 3.1

Ultra precise quadrupoles magnet assembly and testing. Integration of an alignment test-bed towards an industrial production

Assembly of ultra precise quadrupoles

Integration of an alignment test-bed

State of the art
Uncertainties estimation
Development of a new Methodology, study of prototypes, final validation

April 15

Interfaces study

Integration of the technical systems

Design of the PACMAN validation bench

Assembly & qualification

Extrapolation to an industrial production

Subject 3.2



Seismic sensor development & vibration characterization

Definition of the requirements

CLIC BDS requirements

CLIC linac requirements

PACMAN requirements

Investigation of different technologies

State of the art

April 15

Definition of procedure of tests & qualification

Comparison with sensors developed at LAPP



Choice of a sensor for PACMAN

July 15

Improve/build prototype to answer CLIC BDS requirements

Subject 3.3

Nano-positioning of the main linac quadrupole as means of laboratory pre-alignment

State of the art

Development of a long range actuator

Requirements definition for 1DOF

Feb. 15

Study & design of solutions

Dec. 15

Performance characterization

June 16

Extrapolation to 4/5 DOF (study)

Oct. 16

PACMAN nano-positioning system

Implementation & qualification of solutions developed for type 1

Sept. 15

Adaptation to the type 1 setup of the PACMAN bench

Dec. 15

Measurements on the PACMAN validation bench

Subject 4.1



Alignment & resolution of a BPM operating at microwave frequencies in the nanometre regime

Determination of a zero of BPM using a stretched wire

State of the art

Evaluation of 2 methods

Qualification on a bench

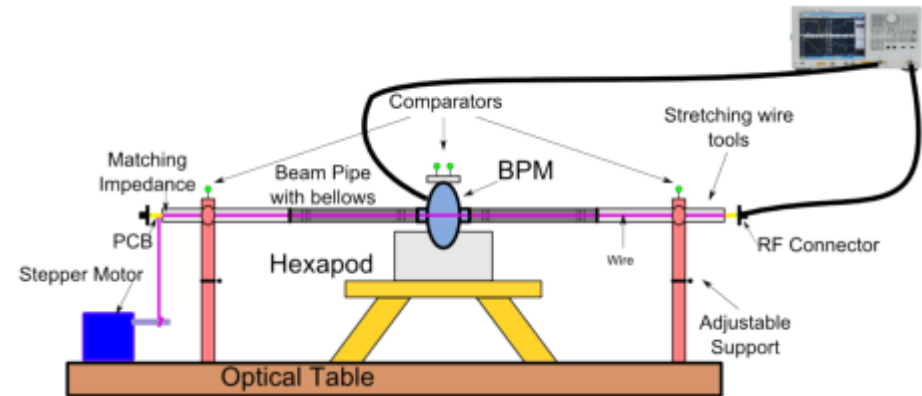
Towards a nanometric resolution

May 15



Integration in PACMAN setup

Measurements on the PACMAN validation bench



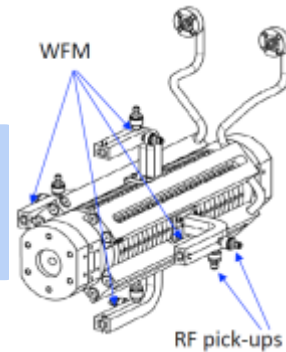
Subject 4.2



EM field alignment of the CLIC accelerating structure with help of WFM signals

Measurement of the internal geometry of AS using wakefields

Data acquisition of structures installed in CTF3

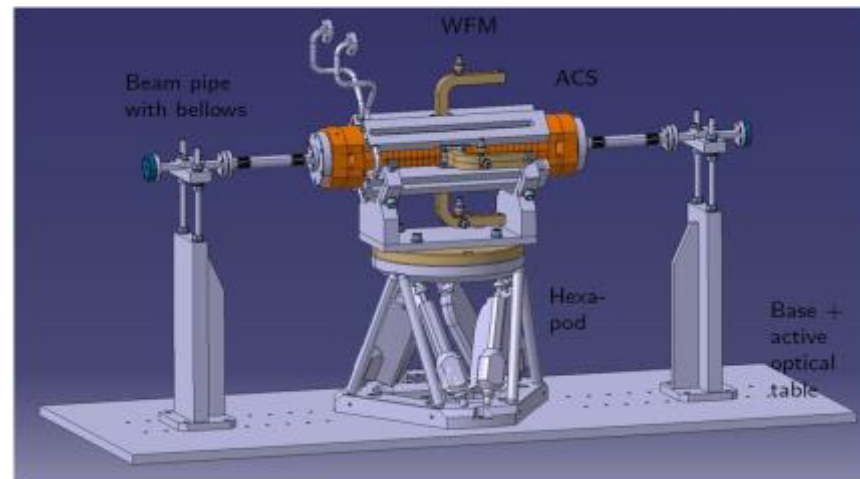


State of the art

Evaluation of 2 methods

Qualification on a bench

Evaluation of solutions for the cell to cell alignment

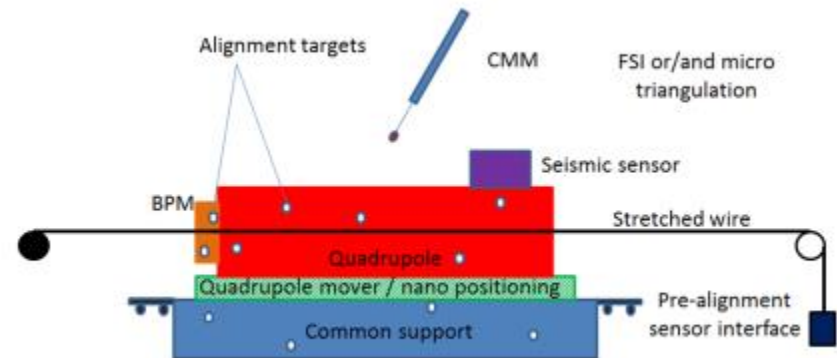


Project schedule

	2013				2014					2015					2016					2017																												
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	A	M	J	J	A										
Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
					Familiarization					Validation					Integration					Analysis and extrapolation																												
	Start of the project									1st workshop: setting up the scenario										2nd workshop: results & first conclusions										3rd workshop: conclusion of the project																		

Project schedule

PACMAN validation bench



Months	2013				2014												2015												2016												2017											
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	A	M	J	J	A		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	44	45	46	47	48		
	Familiarization				Validation												Integration				Analysis and extrapolation																															
	Start of the project																Stretched wire chosen																																			
																	All technical systems integrated																																			
																					All technical systems qualified																															
																					Measurements 1 st step																															
																					Measurements 2 nd step																															