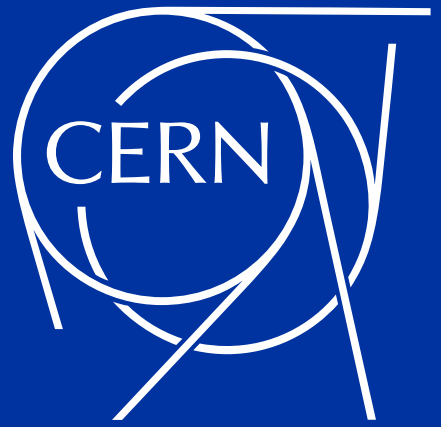


PSB Transfert Lines status March 2020

https://indico.cern.ch/event/910109/

Pierre VALENTIN

2020-04-22

Introduction

This presentation include:

- **The current radial and vertical offsets plots of PSB transfert lines**
- **The main achievements from 2019 to today**
- **A review of the problems encountered during the alignment and smoothing campaigns**
- **A SURVEY feedback to improve the future processes**

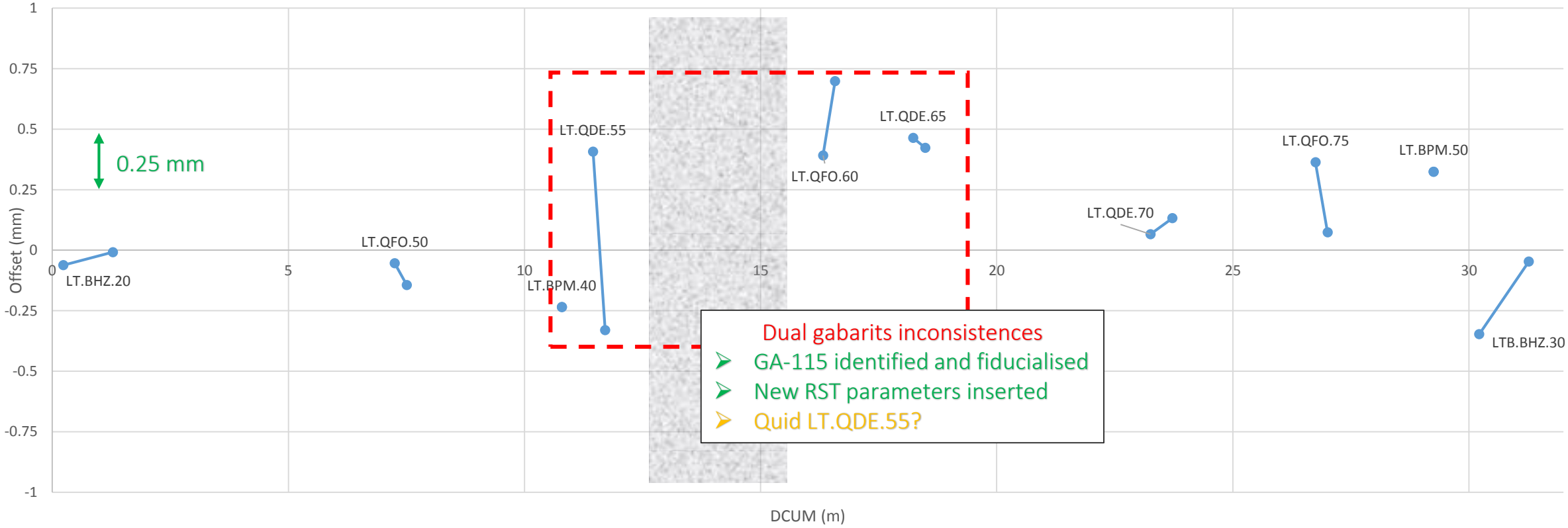
All the offsets are given with respect to **the theoretical beam position**, i.e. taking into account the roll angle of the elements

LT line

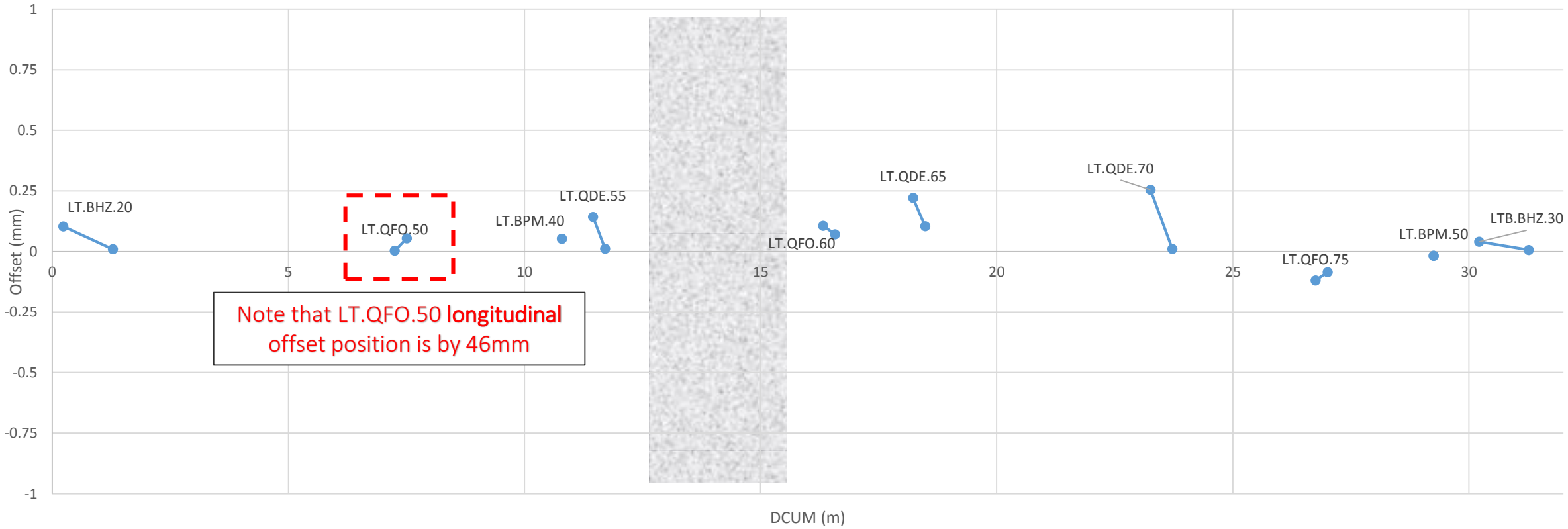
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

LT line – Radial offsets (mm/m)



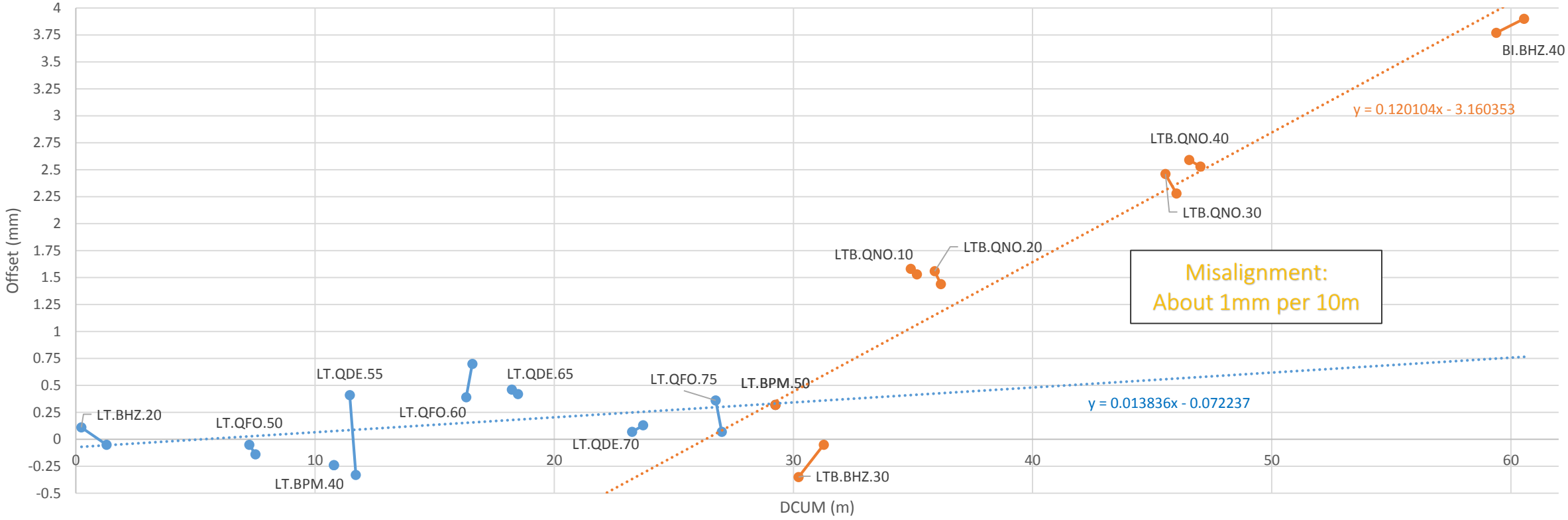
LT line – Vertical offsets (mm/m)



LT/LTB lines relative geometry

BEAM Radial offsets

LT/LTB lines – Radial offsets (mm/m)

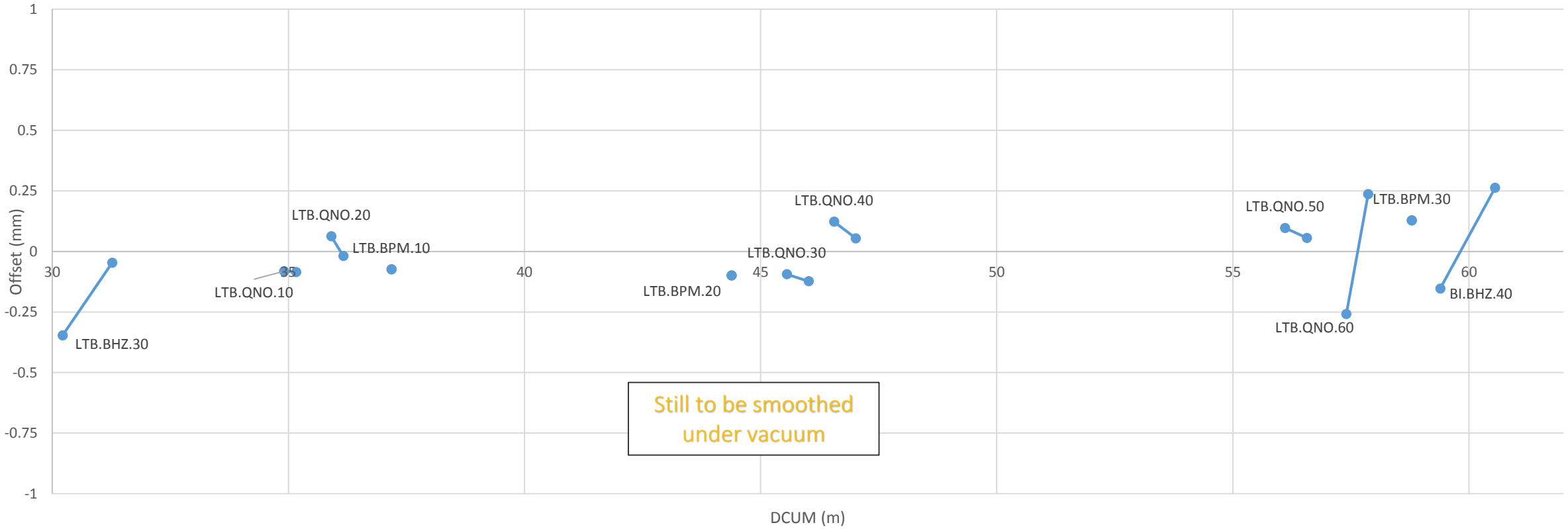


LTB line

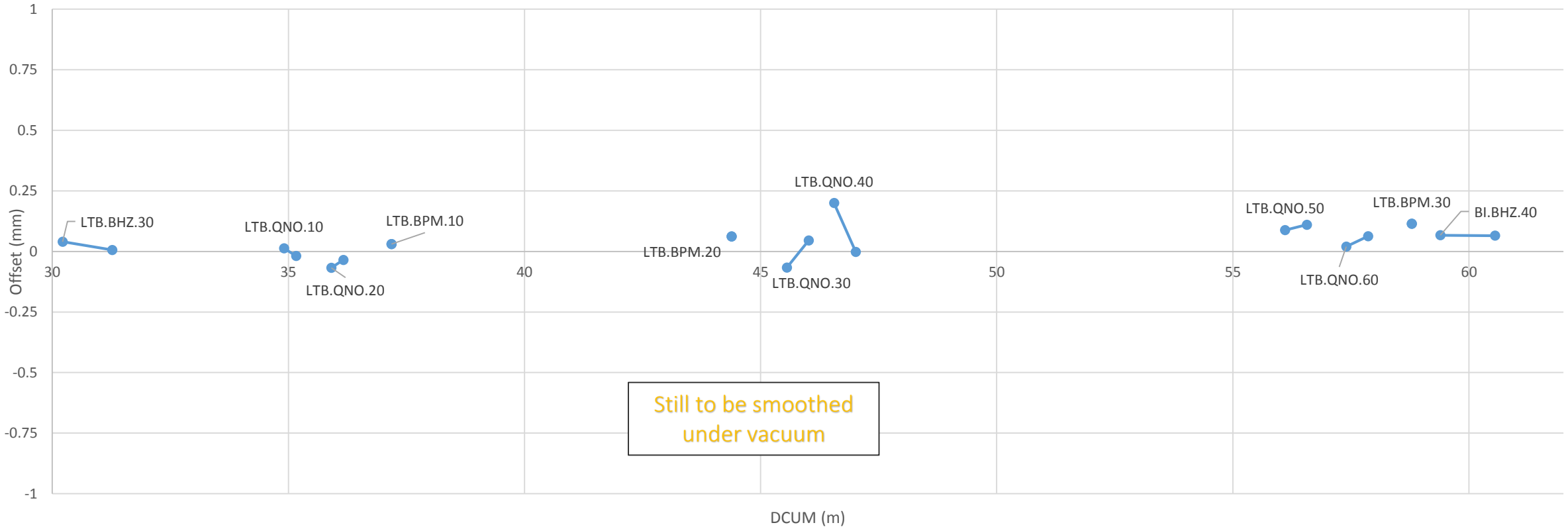
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

LTB line @atm. pressure – Radial offsets (mm/m)



LTB line @atm. pressure – Vertical offsets (mm/m)

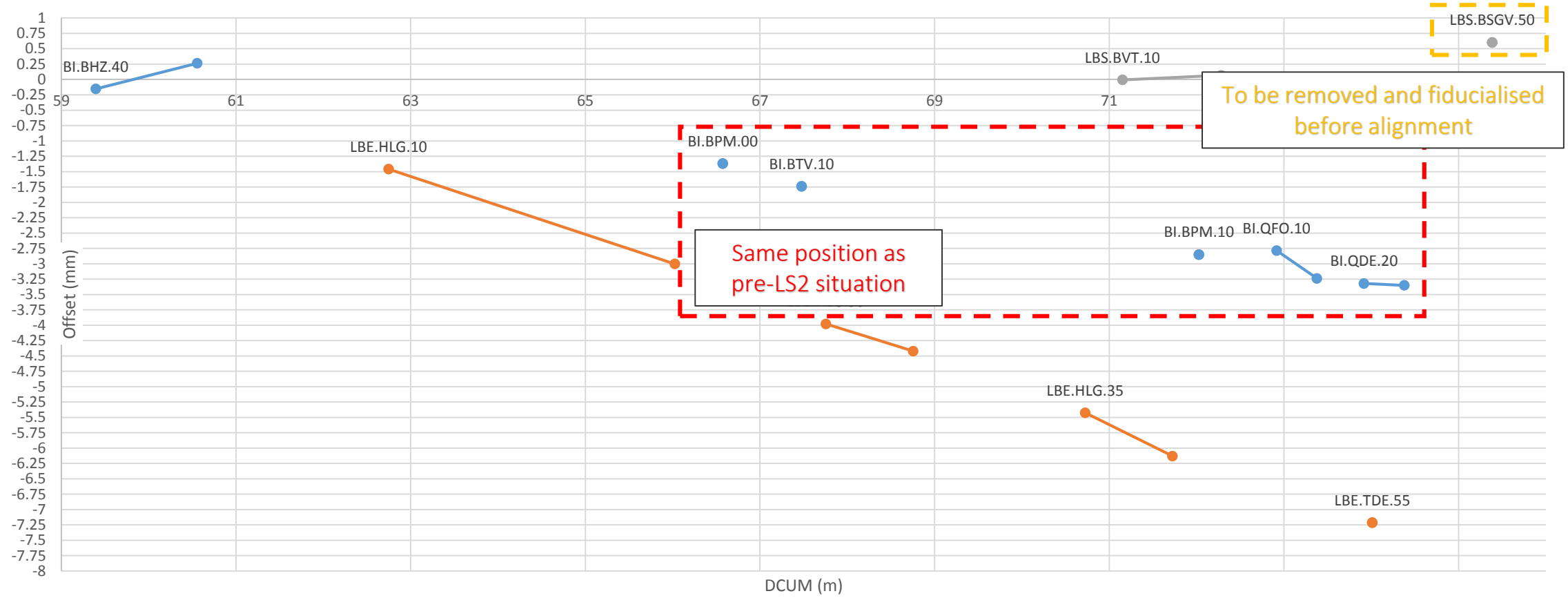


LBE / LBS lines

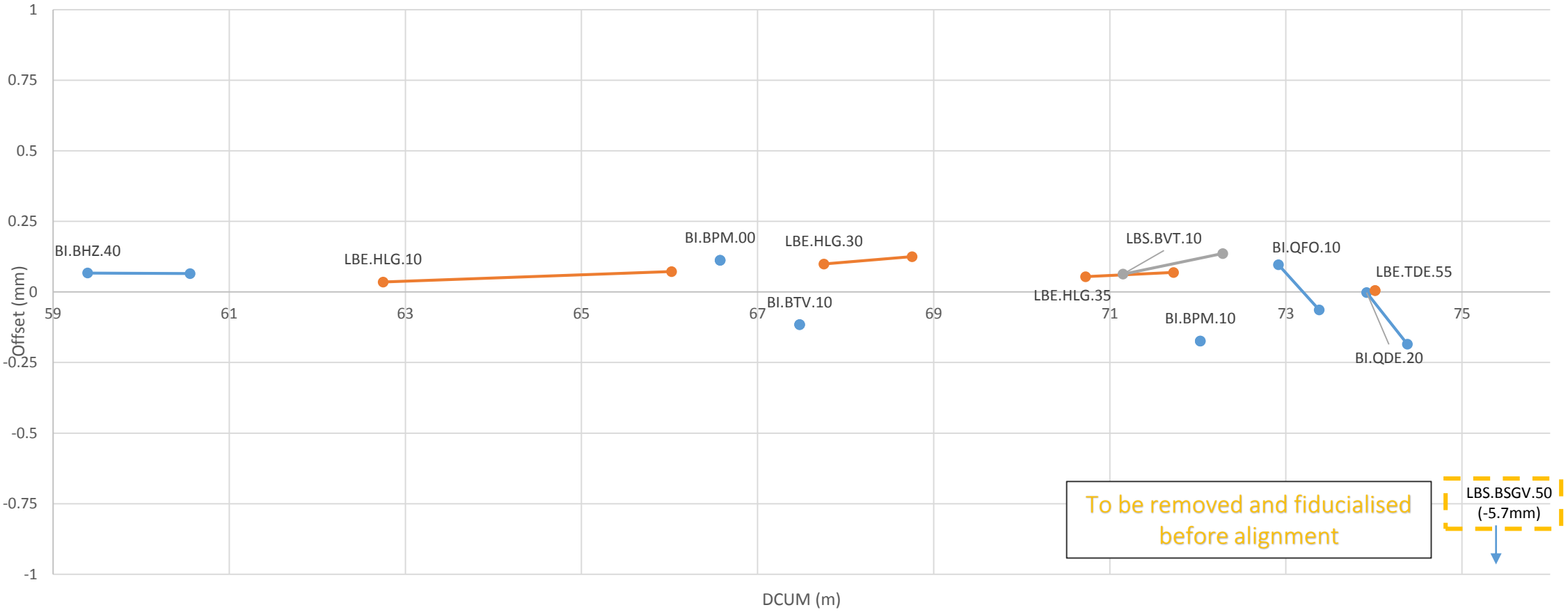
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

LBE area lines – Radial offsets (mm/m)



LBE area lines – Vertical offsets (mm/m)

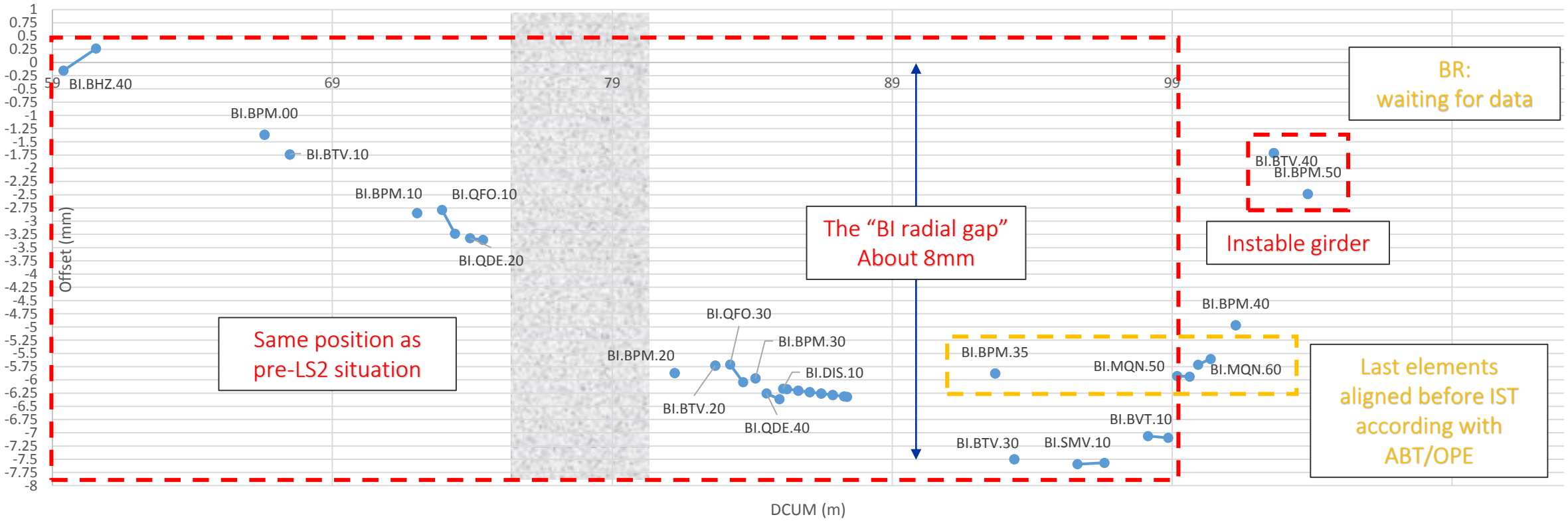


BI line

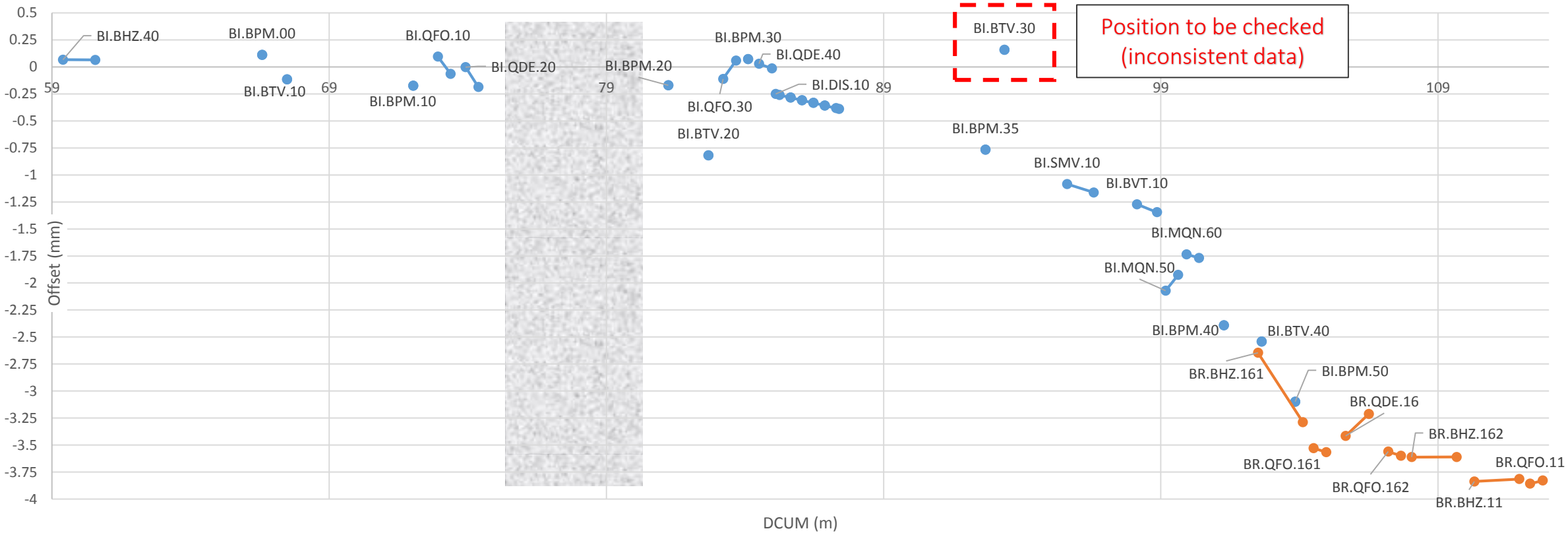
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

BI line – Radial offsets (mm/m)



BI line – Vertical offsets (mm/m)

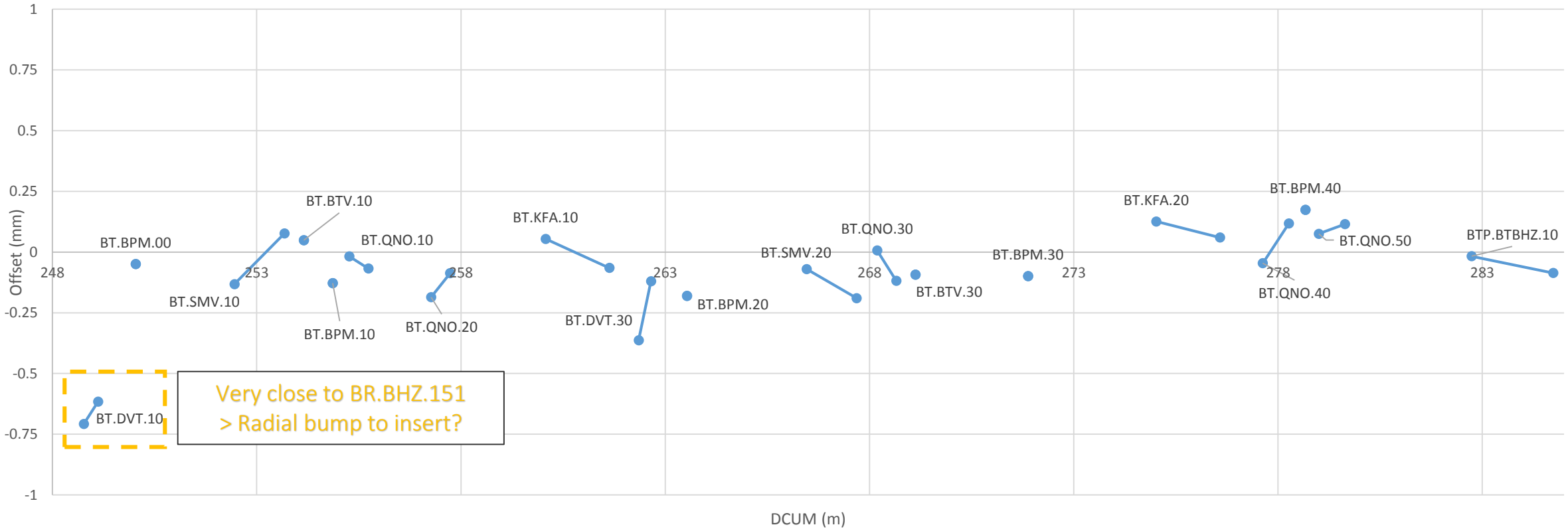


BT line

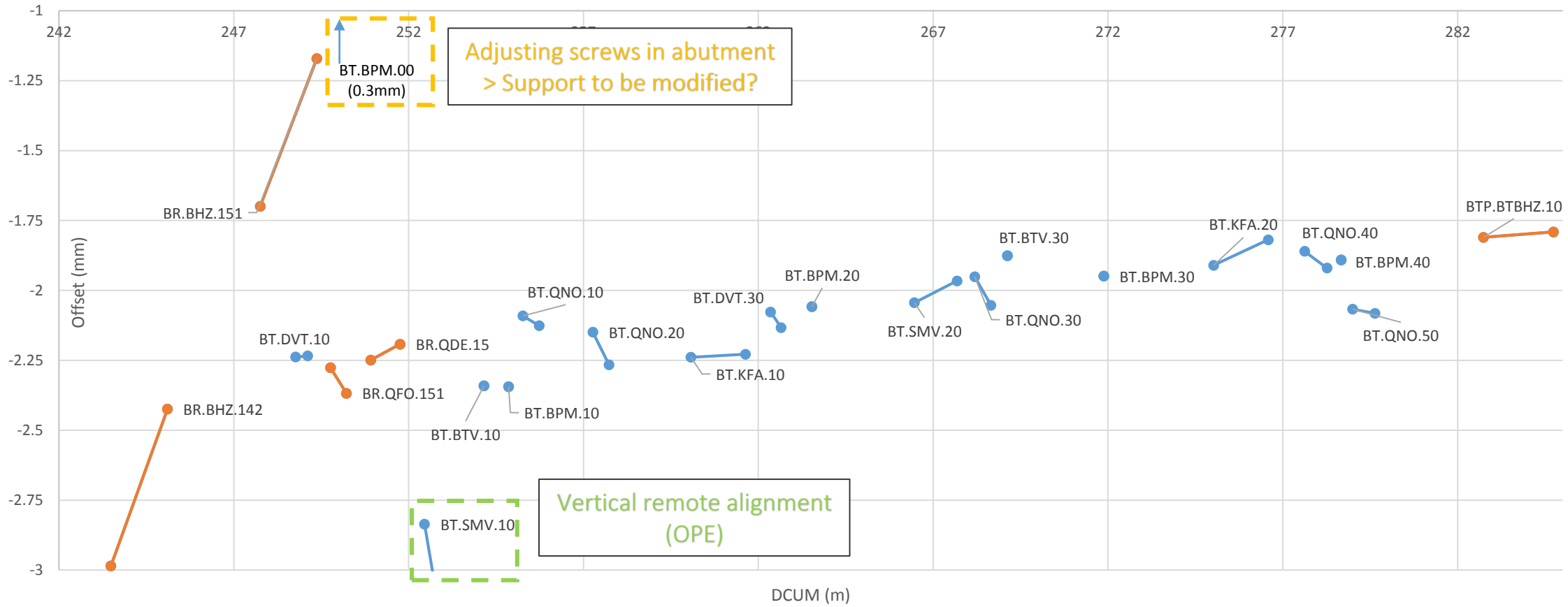
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

BT line – Radial offsets (mm/m)



BT line – Vertical offsets (mm/m)

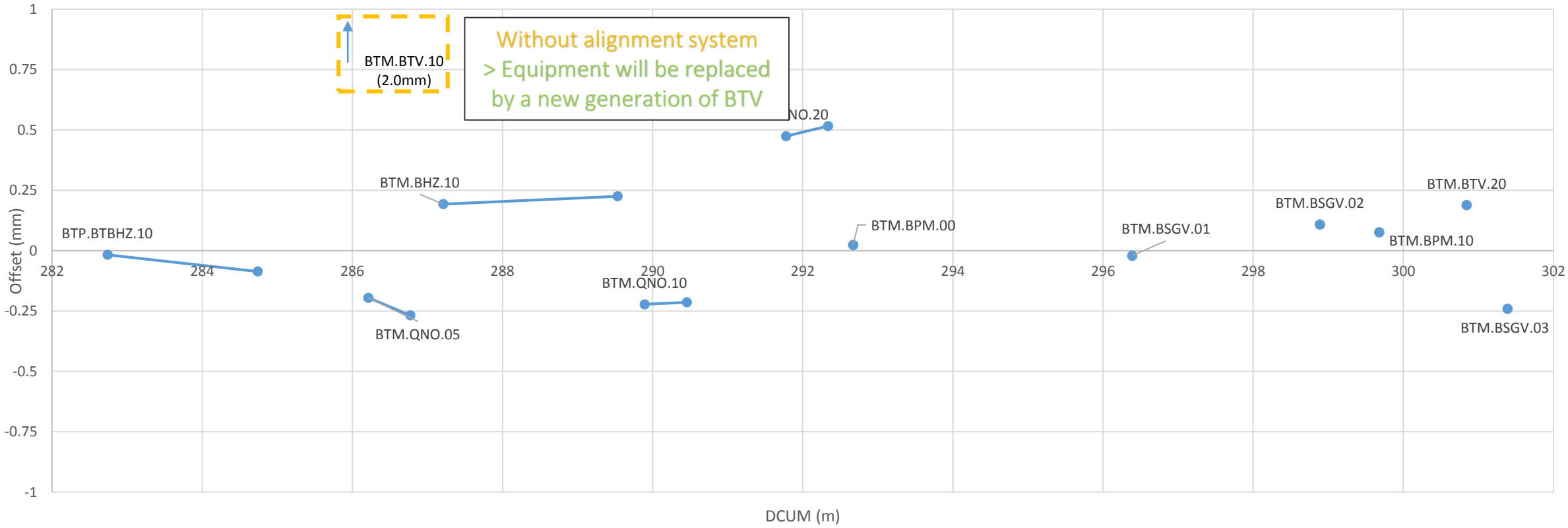


BTM line

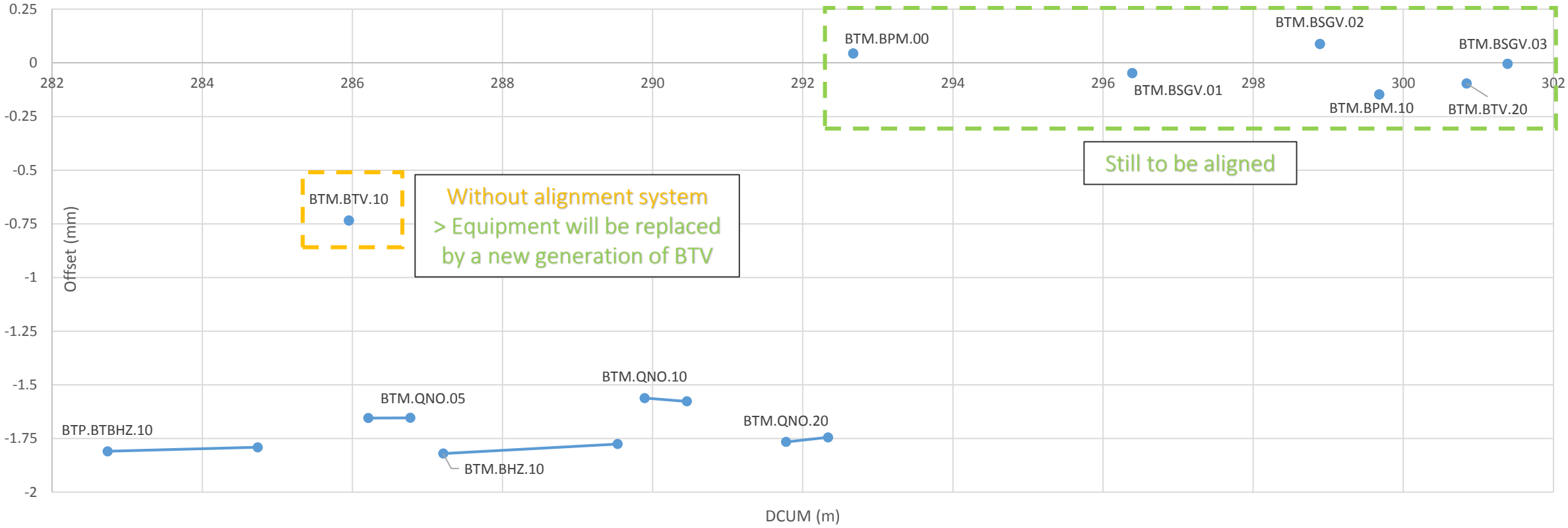
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

BTM line – Radial offsets (mm/m)



BTM line – Vertical offsets (mm/m)

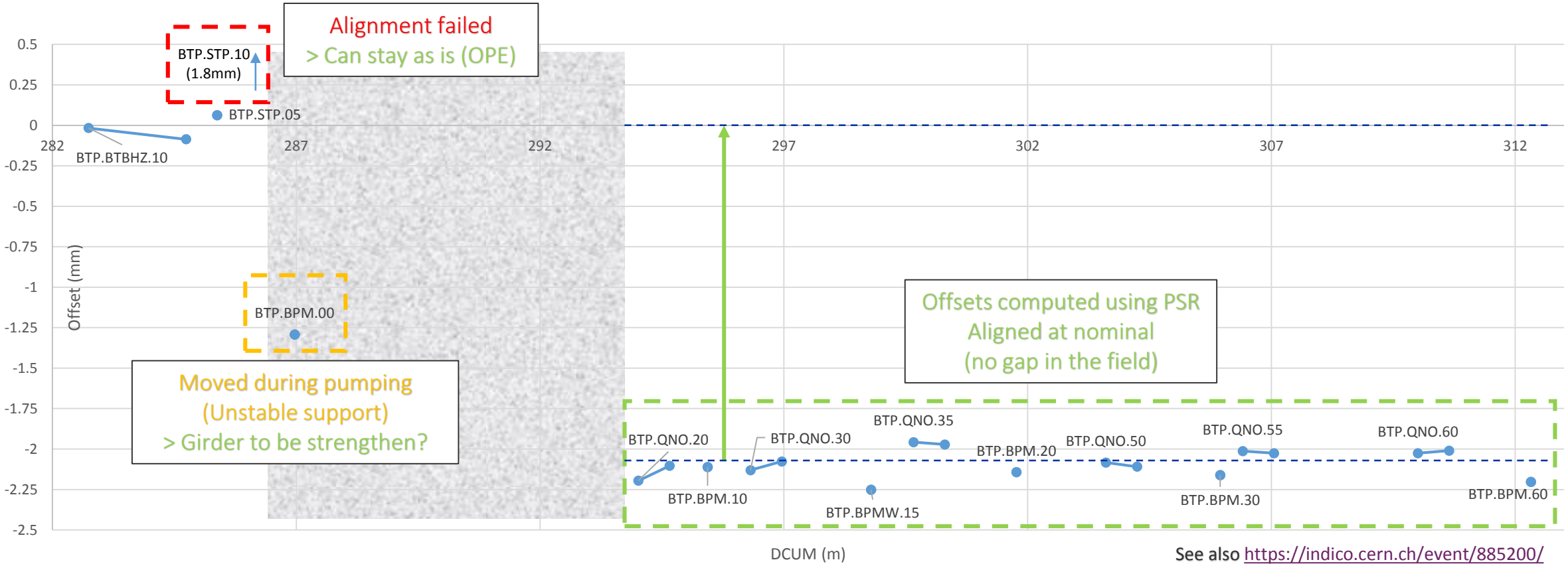


BTP line

BEAM Radial and Vertical absolute offsets

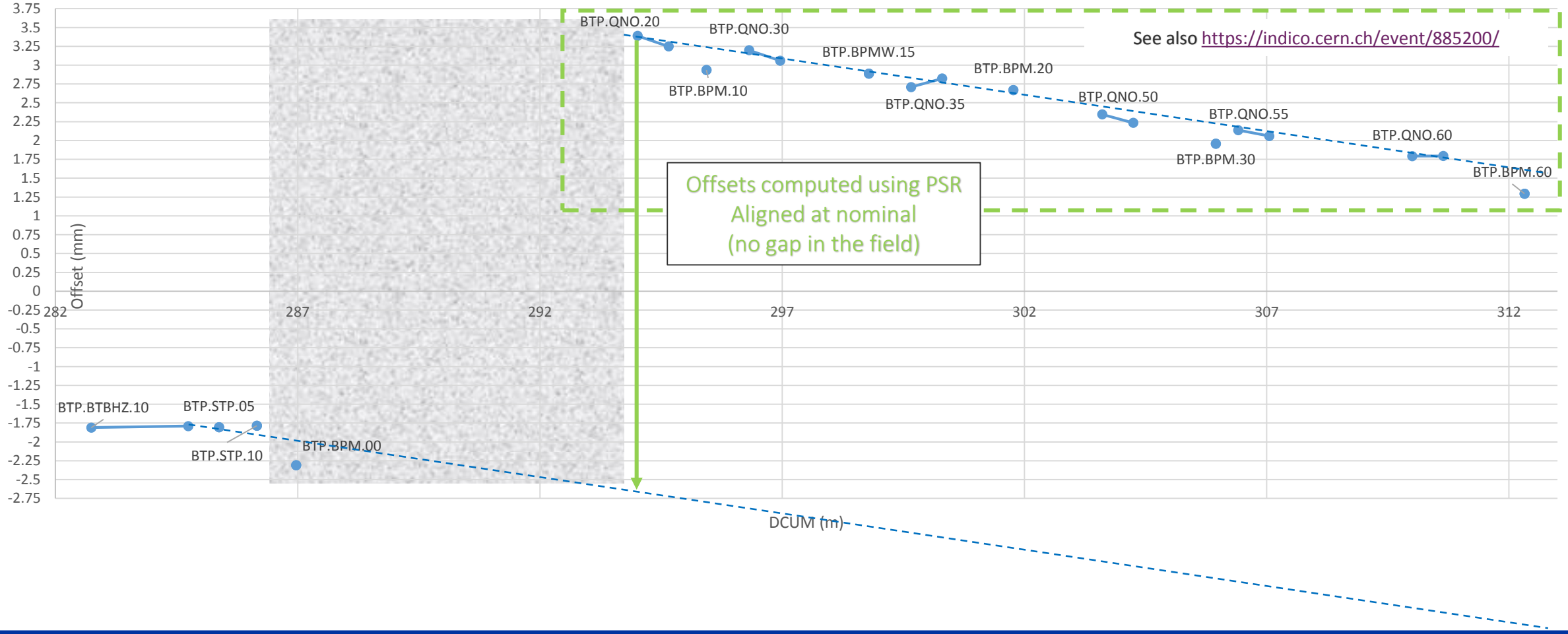
(i.e. wrt theoretical position)

BTP line – Radial offsets (mm/m)



See also https://indico.cern.ch/event/885200/

BTP line – Vertical offsets (mm/m)

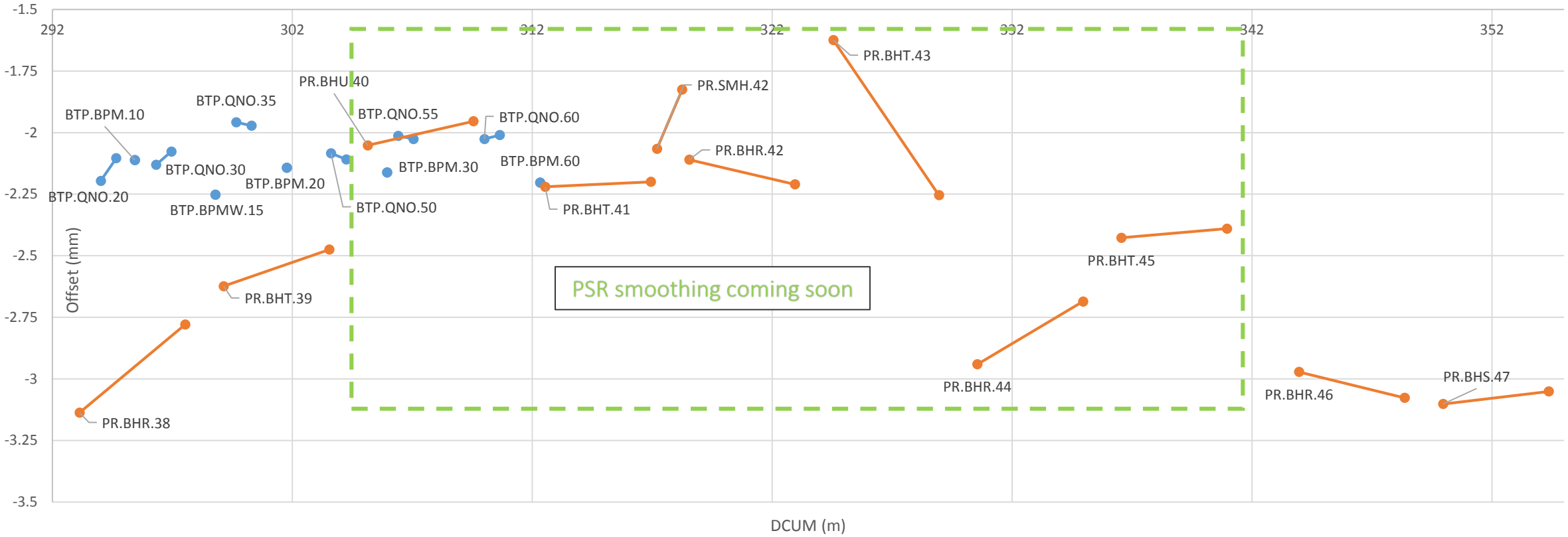


PS injection

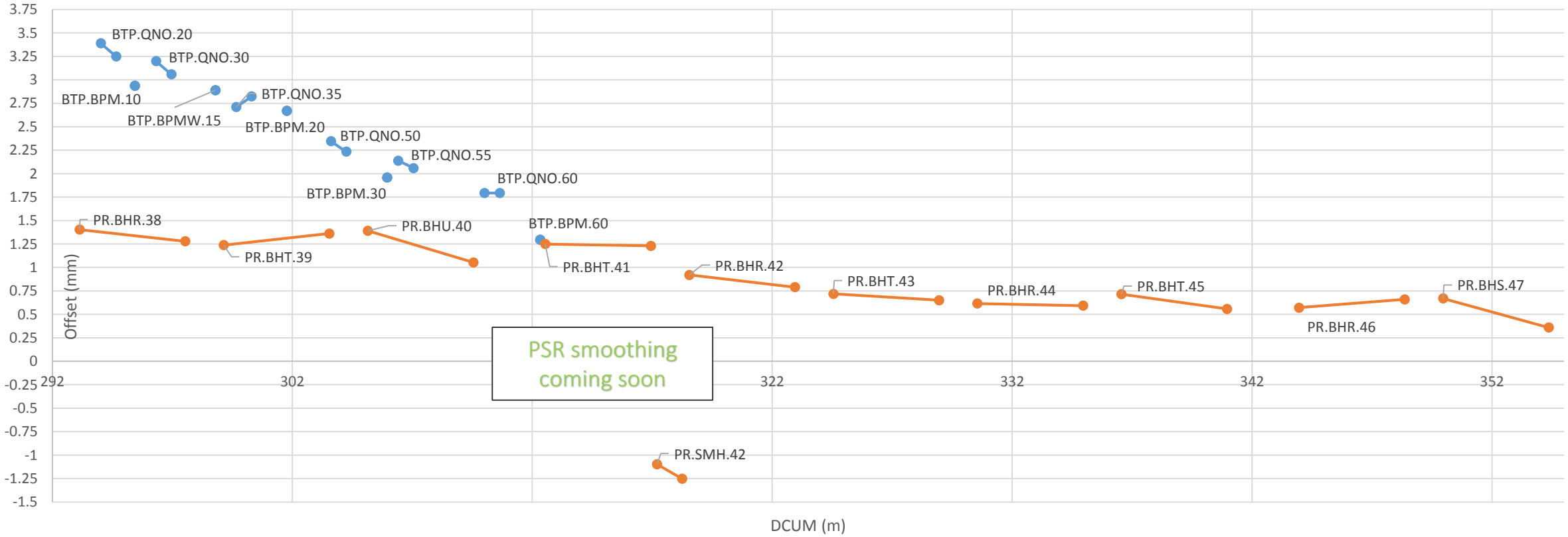
BEAM Radial and Vertical absolute offsets

(i.e. wrt theoretical position)

PS injection – Radial offsets (mm/m)



PS injection – Vertical offsets (mm/m)



Main Achievements

- **Over 3,500 measurements since January 2019**
- **At least 15 weeks of field work during smoothing campaigns (2020)**
- **More work than expected**
  - Additionnal fiducialisations in the field and in workshop (SEMgrids, BTVs)
  - BTM realignment
  - Repeat of prealignments (LTB and BTP lines)
- **Much better situation than before LS2 and well known (freely available via GEODE)**
- **Improved procedures and well documented lines**
- **Personal skill development and good knowledge of the PSB actors**

Unforseens

- **A lot of unforseens due to (not exhaustive…)**
  - A lack of preparation
  - 3 shieldings to cross (LT, BI, BTP)
  - Non-standard cases
  - Unstable supports
  - Alignment systems design (missing DOF, radial/longitudinal screws switched, systems in abutment, etc.)
  - Unavailable released drawings or missing dimensions
  - Past mistakes: false RST parameters, missing bumps, non-existent alignment methods, lost gabarits, large misalignments (dL), etc.
  - Some inexperience…

Feedback

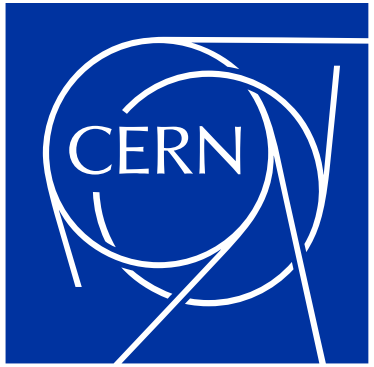
- An initial measurement of all the lines would have prevented the BI gap and saved a lot of time (BTP realignment)
- Pre-alignments were very time consuming due to the «one by one» strategy
- Keeping the survey lines of sight in the shieldings opened from the start to close would be useful
- Plan a slot after the smoothing campaigns to make an overall measurement of all the lines together
- ASG section should be more involved in the equipment design to avoid nasty surprises

Upcoming task: Waiting for restart

- **BTM realignment**
  - ~ 2 working days
- **LTB smoothing**
  - ~ 4 working days
- **LBS.BSGV.50**
  - To be removed and upgraded at workshop (adding a fiducial)
  - Fiducialisation, reinstallation and alignment
- **LT.QFO.50**
  - Longitudinal misalignment by 46mm downstream
  - @ABT, is to be moved?
- **BT.DVT.10 in the field inspection** (cf. radial offset)
- **Manufacturing of a new gabarit for BTM SEMgrids?**

Upcoming tasks: to be discussed

- **Design improvements**
  - Supports (LBS.BSGV.50, BT.BPM.00, BI line close to BR injection)
  - Alignment systems (BI.BTV.40, BTM.BTV.10, BTP.BPMW.15)
- **Insertion of voluntary displacements in SUdb**
  - BT.DVT.10 (radial)
  - BT/BTM lines (-2mm vertical offset)
  - What about the longitudinal offsets? Up to 18mm…
- **How to manage the calculation artefacts of BTP line?**
  - Insertion of voluntary displacements in SUdb?
  - New global calculation?
- **«BI radial gap» correction**
  - Next YETS?



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