

Injector Optics Repository - Status Update

LIU-PSB Configuration

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Optics Repository for Injectors

- ▶ BE-ABP maintains a files repository related to MAD-X beam design and simulation program (input & output files, tools for specific uses)
- ▶ The optics repository is being transferred from SVN to GitLab
 - ▶ necessary due to AFS/SVN phase out
 - ▶ easier management of files, versions & updates
 - ▶ support collaborative effort on optics or layouts

<http://cern-accelerators-optics.web.cern.ch/cern-accelerators-optics/>

The image shows a composite of three elements:

- Left:** A screenshot of the website <http://cern-accelerators-optics.web.cern.ch/cern-accelerators-optics/>. It features a navigation menu with categories like LHC optics, SPS optics, PS optics, PS Booster, LEIR optics, AD optics, and ELENA optics. Below the menu is a numbered list of 18 transfer lines, such as "1. LINAC2 to BOOSTER (LT, LTB, B1)" and "18. ELENA transfer lines (From ELENA to experiments)".
- Center:** A schematic diagram of the CERN accelerator complex, showing the paths of various beams from LINAC2 through the SPS, PS, and PSB to the LHC and other experiments like Alice and CMS.
- Right:** A screenshot of the GitLab repository page for <https://gitlab.cern.ch/injector-optics>. The page shows the repository name, a search bar, and a list of projects including "PS PS Ring Optics Repository" and "PSB PS Booster Optics Repository".

Two large arrows indicate the transition: a red arrow points from the website to the GitLab page, and a green arrow points from the diagram to the GitLab page.



Optics Repository for Injectors

- ▶ An EOS based directory structure will be maintained for easier access via CERN linux machines and cernbox
 - ▶ /eos/user/i/ijnopt/InjectorOptics/
 - ▶ gradually all the present afs repository will be copied to this location
 - ▶ need to setup and define access rights - I still have to learn how to do it with EOS!
- ▶ The GitLab and EOS repositories should be used as reference for the official released files
 - ▶ GitLab allows to download copies for use in local directories
 - ▶ GitLab also allows developers to be connected to the repository for easier merging and file updates
 - ▶ we would need to set-it up, would like to know who should be contributing to the PSB studies
 - ▶ the good practice would be to avoid distributing local versions to other users; preferred to branch off directly from the main repository in GitLab
 - ▶ profit from updates and maintain the possibility to easily merge your work back to the official version



Optics Repository for Injectors - PSB implementation

- ▶ The 2017 optics is available and up-to-date
- ▶ Fixed directory structure with all relevant files
 - ▶ input/output
- ▶ Sequence generated from Layout-DB download
 - ▶ scripts to convert to MAD-X input files
- ▶ Working on a tool to extract and compare with GEODE information and prepare (mis)-alignment file
- ▶ Readme file with instructions in each directory

PSB
PS Booster Optics Repository

Star 1 Fork 1 KRB5 https://:@gitlab.cern.ch:8443

Files (4.1 MB) Commits (27) Branches (14) Tags (12) Readme Add Changelog Add License Add Contribution guide Set up CI

master PSB / History Find file

Merge branch '2017' into 'master' Ilias Efthymiopoulos committed 5 months ago 748972f8

Name	Last commit	Last Update
alignment	Initial upload 2017 PSB optics	7 months ago
aperture	New structure for the directories and files for 2017. First u...	7 months ago
aux	Initial upload 2017 PSB optics	7 months ago
beam	PSB optics configuration for 2017 operation.	5 months ago
cmd	Optics update for 2017 operation. Modifications to file stru...	5 months ago
elements	Optics update for 2017 operation. Modifications to file stru...	5 months ago
layoutDB	Optics update for 2017 operation. Modifications to file stru...	5 months ago
madx	Optics update for 2017 operation. Modifications to file stru...	5 months ago
output	Optics update for 2017 operation. Modifications to file stru...	5 months ago
sequence	Optics update for 2017 operation. Modifications to file stru...	5 months ago
strength	Optics update for 2017 operation. Modifications to file stru...	5 months ago
survey	Optics update for 2017 operation. Modifications to file stru...	5 months ago
test	Optics update for 2017 operation. Modifications to file stru...	5 months ago
.htaccess	Upload 2008 optics from CVS	7 months ago
README.md	New structure for the directories and files for 2017. First u...	7 months ago



Optics Repository for Injectors - PSB implementation

- ▶ Branches and Tag for each year
- ▶ Yearly branches merged to the master when operational and verified
 - ▶ allows to continue developing on a year files (corrections, simulations, etc)

Project **Repository** Registry Issues 0 Merge Requests 0 Pipelines Members Settings

Files Commits **Branches** Tags Contributors Graph Compare Charts

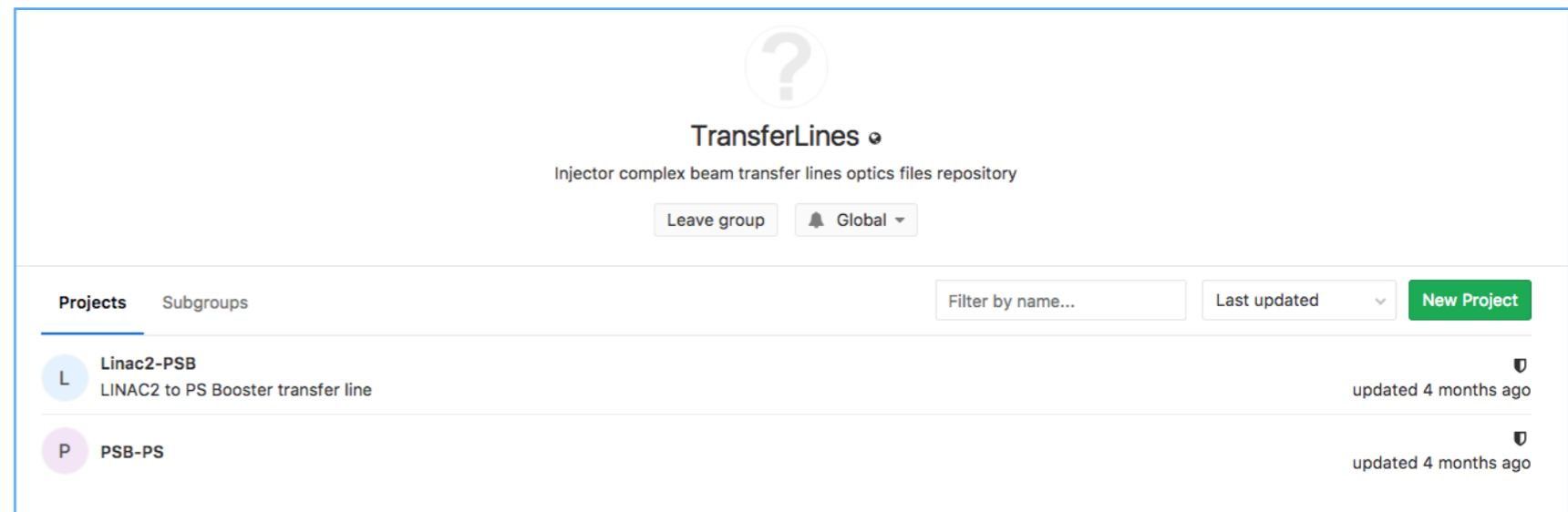
Protected branches can be managed in [project settings](#) Filter by branch name Last updated ▼ Delete merged branches New branch

Branch	Commit	Description	Progress	Actions
2005	ed86f72d	Update README.md · 7 months ago	23 / 1	Merge request Compare
2006 merged	f4866a2a	2006 optics from CVS repository · 7 months ago	22 / 0	Merge request Compare
2007 merged	166c7fdd	PSB 2007 optics from cvs · 7 months ago	20 / 0	Merge request Compare
2008 merged	650d88d3	Upload 2008 optics from CVS · 7 months ago	18 / 0	Merge request Compare
2009 merged	c0f8f5db	Upload 2009 optics from CVS repository · 7 months ago	17 / 0	Merge request Compare
2010 merged	4206014e	Upload 2010 optics from CVS repository · 7 months ago	16 / 0	Merge request Compare
2011 merged	a0c72f7e	Upload 2011 optics from CVS repository · 7 months ago	15 / 0	Merge request Compare
2012 merged	07514082	Upload 2012 optics from CVS repository · 7 months ago	13 / 0	Merge request Compare
2013 merged	0999d414	Upload 2013 optics from CVS repository · 7 months ago	12 / 0	Merge request Compare
2014 merged	3638bf8e	Upload 2014 optics files from CVS repository · 7 months ago	11 / 0	Merge request Compare
2015 merged	3dfc2fb4	Update README file · 7 months ago	9 / 0	Merge request Compare
2016 merged	36e35ec7	Upload 2016 Optics files from afs space (CVS version not available). · 7 months ago	8 / 0	Merge request Compare
2017	454f0979	Remove additional sequence file - not in use · 4 months ago	1 / 1	Merge request Compare
master default protected	748972f8	Merge branch '2017' into 'master' · 5 months ago		

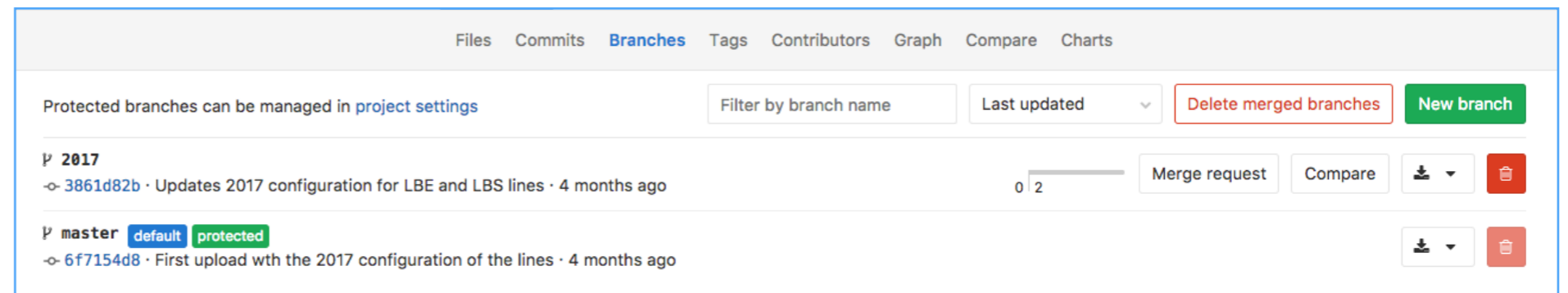


Optics Repository for Injectors - Beam Transfer Lines

- ▶ PSB Injection/Extraction2017 versions implemented in GitLab
- ▶ Same implementation as for PSB: directories, yearly branches, ..



- ▶ Only imported the 2016/2017 versions
 - ▶ lot of effort to do it for all years - do we gain something?
 - ▶ maintain them only on EOS (copy of existing AFS).





Optics Repository for Injectors - post-LIU version

- ▶ For PSB this includes the ring & the injection lines with changes due to LIU update
 - ▶ and what about LINAC4?
- ▶ The target is to download and synchronise the files with the Layout-DB implementation - for PSBring and Xfer lines
 - ▶ not before **end January'18** --> Tom's talk
- ▶ In the meantime:
 - ▶ I got today(!) a flat input file from Jean-Baptiste used for PTC tracking in the **PSB ring**
 - ▶ that should be the latest update(?) but I would need someone to check and verify the layout changes
 - ▶ not easy to convert to MAD-X input !!
 - ▶ I also got the latest files from Christoph early this week for the **Xfer lines**
 - ▶ not the final version yet, but a good starting point he agrees to upload to Git
 - ▶ With those, I will try to prepare a branch in the GitLab for post-LIU configuration and prepare all associated files for MAD-X
- ▶ Have something ready by **middle November** (end of next week!) and cross-check later with the Layout-DB



Other activities

- ▶ Discussion to harmonize the implementation and tools for the communication between the LayoutDB and GEODE databases
- ▶ Working on a document to define the start/end points of each beam line segment (and ring)
 - ▶ goal is to have them visible in the layout drawings
 - ▶ defined as markers and used for reference in the survey and MAD-X files
 - ▶ few changes wrt present configuration
 - ▶ but transparent to operations and simulations

Date: 2017-11-02

NOTE

Start and End Points in the Injector Complex Rings and Transfer Lines

ABSTRACT:

To clarify and harmonise the description of the rings and transfer lines in the CERN Injector Complex in the Layout and Survey databases and the MAD-X descriptions, start and end points of each beam segment are defined. The definition of the points in the survey CGS (GEODE) convention is used as reference. The start/end points will be stored as markers in the Layout-DB and MAD-X files and become visible in the generated layout drawings.

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Beam segment - Start/end points

▶ Example PSB:

- ▶ start point: 0.5850 m upstream of BI3.KSW1L1 centre
- ▶ end point : 0.8088 m downstream of BR.BHZ162 centre
- ▶ segment length : 157.08 m

