

KURRI analysis scripts

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KURRI related websites

Collaboration meetings: ffag.pp.rl.ac.uk/FFAG/colabo/

Experimental log and data (3/14 – 7/15): <https://sites.google.com/site/kurrifag/home>

(The data is stored on Google Drive).

Simulations codes and scripts: <https://github.com/orgs/fixed-field-accelerator-simulation/teams/collaborators/repositories>

(Includes repositories for analysis scripts, MAUS, OPAL, Scode and Zgoubi).

Analysis scripts (1)

davidkelliher add beamsize script		Latest commit b98e2f0 a minute ago
📁 Machida-RF	latest Python script on 26 September 2015.	3 years ago
📁 defs	Fixed qinbin script	3 years ago
📁 profiles/2014-03-31	Add time to loss data	3 years ago
📄 acc_cycle.dat	added acc_cycle.dat	4 years ago
📄 analysedata.py	move analysedata.py to top directory	an hour ago
📄 beamsize_160426.py	add beamsize script	a minute ago
📄 bpm20140326.py	Read BPM and give relative position.	4 years ago
📄 dispersion_analysis.py	cleaning up files	4 years ago
📄 fixedE_COD_20150623.py	Added Shinji's RF scripts	3 years ago
📄 kvalue_analysis_poly.py	cleaning up files	4 years ago
📄 orbit_analysis_150930.py	Add orbit_analysis_150930.py script	3 years ago
📄 qinbin_150930.py	Add updated qinbin script	3 years ago
📄 qinbin_march31.py	Fixed qinbin script	3 years ago

git clone https://github.com/fixed-field-accelerator-simulation/KURRI_analysis_scripts.git

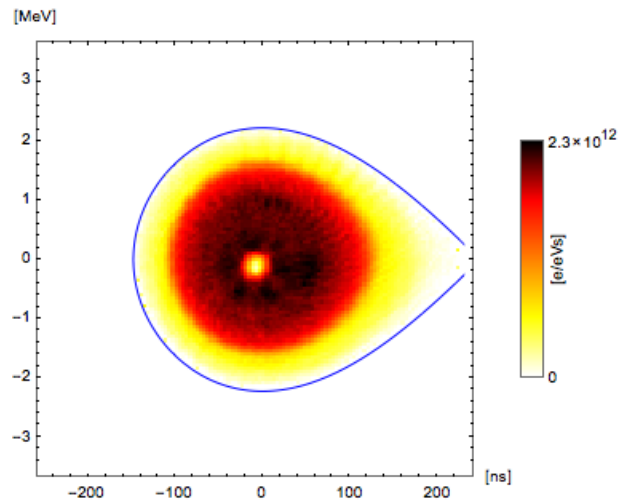
Analysis scripts (2)

Script	Figures	Description
analysedata.py	-	Low level functions – e.g. read scope data, find peaks, fit data etc.
qinbin*.py	8	For each probe position calculate time of beam loss from bunch monitor signal.
dispersion_analysis.py kvalue_analysis_poly.py orbit_analysis_150930.py	9, 10, (11,12)	Following algorithm described in the paper, calculate field index and dispersion as a function of momentum. COD probably calculated in orbit_analysis. We probably only need one of these (to be determined).
bpm20140326.py	17, 18	Read BPM data and calculate relative position and tune.
beamsize_160426.py	13, 14	Use fall-off time of bunch monitor signal to estimate beam size.
-	20	Calculate dispersion at foil position.
-	22, 23	Measure tune using spectrum analyzer across momentum range.
-	24, 25	Foil thickness calculation based on beam capture in stationary bucket.

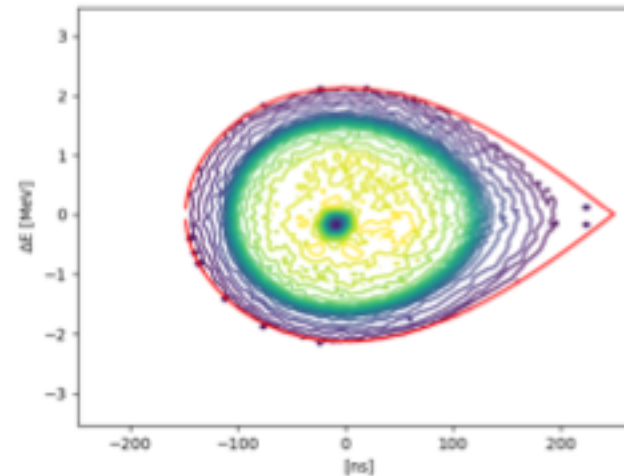
Scripts in the git repository and related figures in the PTEP paper.

CERN tomography code (1)

- <http://tomograp.web.cern.ch/tomograp/>
- Code itself is written in Fortran 95. Based on algorithm devised by S. Hancock.
- Mathematica used for post-processing and graphical display. Most of the Mathematica functions failed to work – perhaps because it was written for an older version.
- Redo the post-processing in python.



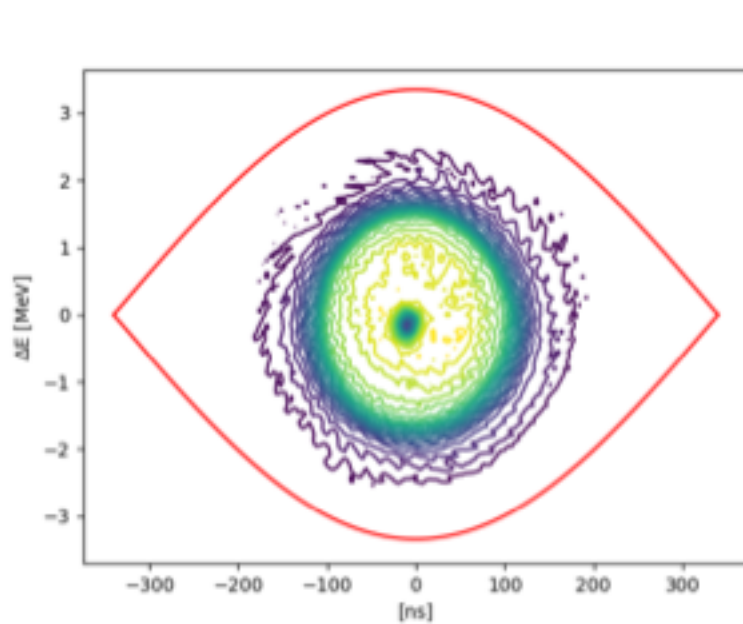
Original Mathematica example
(psbnotch.nb)



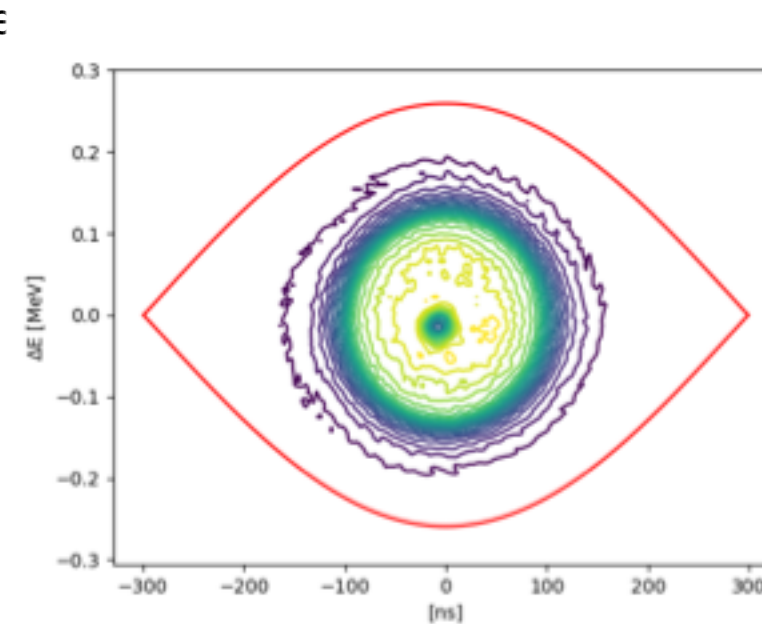
Python output.

CERN tomography code (2)

- Change dB/dt to zero to obtain stationary bucket. Use same data as in original example!
- Change parameters to those of the 150 MEV ring at KURRI but use the same input



Example case
Synch. tune:
0.0007



“KURRI” case
Synch. tune:
0.005