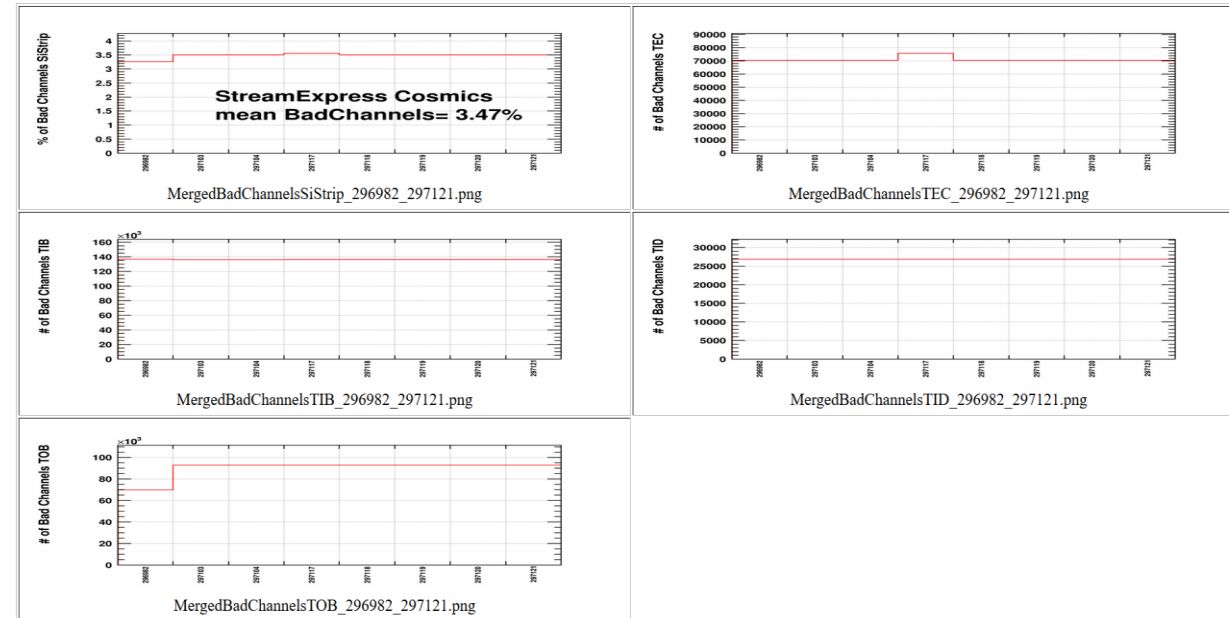


Bad Components Trend Plotter

User Guide

The aim of the tool

- Replace Merged Bad Channels Tool:
 - http://vocms061.cern.ch/event_display/MergedBadChannels/
 - Shell script that produces bad component trends
 - Static png images
 - Not very user friendly
- Provide:
 - More flexibility
 - Easiness of use
 - New features



Bad Components Trend Plotter

Bad components selection

Strip

TIB

TID

TOB

TEC

Pixel (clusters)

Characteristics

Strips

Mean Occupancy

APVs

Inefficient ROCs

Noisy Cols

Fibers

Dead ROCs

Modules

Inefficient DCols

Standard Presets

Strip

Pixel

Pixel Barrel

Pixel Disks

Min/Max trend selection

Options

Expert mode: OFF

Run

270000

300000

270000

285000

300000

Data type:

BEAM

PromptReco type:

e.g. ZeroBias

[Need help?](#)

Start plotting

http://vocms061.cern.ch/event_display/MergedBadChannelsReloaded

Main features

- Create your plots even with 3 clicks:
 - Predefined **Standard Presets** – use most frequently used presets without looking into details
- Flexibility:
 - Choose only those parameters that you really want to monitor from unfoldable panels: detector parts, characteristics (i.e. APVs, ROCs, ...)
 - Pick run range in the way you want:
 - Simple run start – run end
 - Runs in the given date range
 - Custom database queries

Main features

- **NEW:** Track extreme values (i.e min/max number of clusters)
 - Monitor whether Tracker module is among those that appear to have extreme value
- **NEW:** Customizable plots:
 - Switch from linear to logarithmic scale
 - Show/Hide fill tags
 - Superimpose all trends
 - Save your plot on the disk
 - And More...
- **NEW:** Extended in-GUI help
 - most objects have tooltips that explain how to use given switch – just hover your mouse

Choosing what you want to plot

- Select Bad Components:
 - Choose them from the unfoldable Strip/Pixel structured panel (**Bad components selection**)
- Choose your **Characteristics** appropriately:
 - If you select only Strip parts and Pixel-related characteristics you will get no plots (and vice versa)
 - You can choose multiple **Characteristics** in that way you will get many plots for the single component:
 - Barrel Layer 1 & (Dead ROCs + Mean Occupancy) -> 2 plots on the canvas

The screenshot shows a web-based interface titled "Bad components selection". It has a blue header bar with the title. Below the header, there are two main sections: "Strip" and "Pixel (clusters)". The "Strip" section is currently selected and highlighted in blue. It contains a list of components: "Barrel" and "Endcap". The "Barrel" section is expanded, showing four sub-items: "Barrel Layer 1", "Barrel Layer 2", "Barrel Layer 3", and "Barrel Layer 4". The "Endcap" section is collapsed. Below these sections, there is a "Characteristics" section with a light blue header. It contains a grid of checkboxes for various characteristics: "Strips", "APVs", "Fibers", "Modules", "Mean Occupancy", "Inefficient ROCs", "Dead ROCs", "Inefficient DCols", and "Noisy Cols". The "APVs" and "Dead ROCs" checkboxes are checked. At the bottom of the interface, there is a "Standard Presets" section with a yellow header. It contains four buttons: "Strip", "Pixel", "Pixel Barrel", and "Pixel Disks".

Bad components selection

☒ Strip

☐ Pixel (clusters)

☐ Barrel

- ☒ Barrel Layer 1
- ☒ Barrel Layer 2
- ☐ Barrel Layer 3
- ☐ Barrel Layer 4

☐ Endcap

- ☐ Ring 1 Disk- 1
- ☐ Ring 1 Disk- 2
- ☐ Ring 1 Disk- 3
- ☐ Ring 1 Disk+ 1
- ☐ Ring 1 Disk+ 2
- ☐ Ring 1 Disk+ 3
- ☐ Ring 2 Disk- 1
- ☐ Ring 2 Disk- 2
- ☐ Ring 2 Disk- 3
- ☐ Ring 2 Disk+ 1
- ☐ Ring 2 Disk+ 2
- ☐ Ring 2 Disk+ 3

Characteristics

- ☐ Strips
- ☒ APVs
- ☐ Fibers
- ☐ Modules
- ☐ Mean Occupancy
- ☐ Inefficient ROCs
- ☒ Dead ROCs
- ☐ Inefficient DCols
- ☐ Noisy Cols

Standard Presets

Strip Pixel Pixel Barrel Pixel Disks

Choosing what you want to plot

- Some component-characteristic pairs are tricky:
 - Top level Pixel (clusters) + whatever Pixel characteristic gives only one plot, the trend of Pixel clusters
 - Inefficient Dcols (IDCs) / Noisy Cols are insensitive to the Ring choice:
 - Ring 1 Disk- 1 and Ring 2 Disk- 1 both will give you trend for Disk- 1
- **TIP:** fast (un)checking:
 - You can conveniently (un)check all checkboxes in the group if you double click one of them
 - Available also in the Min/Max selection panel

The screenshot shows a web-based interface titled "Bad components selection". It has a blue header bar with the title. Below the header, there are two main sections: "Strip" and "Pixel (clusters)".

The "Strip" section has a single checkbox labeled "Strip" which is checked.

The "Pixel (clusters)" section has two sub-sections: "Barrel" and "Endcap".

The "Barrel" sub-section has a checkbox labeled "Barrel" which is unchecked. Below it, there are four checkboxes for "Barrel Layer 1", "Barrel Layer 2", "Barrel Layer 3", and "Barrel Layer 4". "Barrel Layer 1" and "Barrel Layer 2" are checked, while "Barrel Layer 3" and "Barrel Layer 4" are unchecked.

The "Endcap" sub-section has a checkbox labeled "Endcap" which is unchecked. Below it, there are two columns of checkboxes. The left column has "Ring 1 Disk- 1", "Ring 1 Disk- 2", "Ring 1 Disk- 3", "Ring 2 Disk- 1", "Ring 2 Disk- 2", and "Ring 2 Disk- 3". The right column has "Ring 1 Disk+ 1", "Ring 1 Disk+ 2", "Ring 1 Disk+ 3", "Ring 2 Disk+ 1", "Ring 2 Disk+ 2", and "Ring 2 Disk+ 3". All checkboxes in this section are unchecked.

Below these sections is a "Characteristics" section with a light blue header. It contains a grid of checkboxes for various characteristics: "Strips", "APVs", "Fibers", "Modules", "Mean Occupancy", "Inefficient ROCs", "Dead ROCs", "Inefficient DCols", and "Noisy Cols". "APVs" and "Dead ROCs" are checked, while the others are unchecked.

At the bottom of the interface is a "Standard Presets" section with a yellow header. It contains four buttons: "Strip", "Pixel", "Pixel Barrel", and "Pixel Disks".

Choosing what you want to plot

- **Standard Presets** give you quick access to your mostly used plots:
 - Strip: (TIB + TID + TOB + TEC) && APVs
 - Pixel: (Barrel + Endcap) && Dead ROCs
 - Pixel Barrel (L1 + L2 + L3 + L4) && Dead ROCs
 - Pixel Disks (All Endcap subcomponents) && Dead ROCs
- **Standard Presets** set the default look of the plot:
 - **KNOWN ISSUE:** If you plot for the first time using Standard Preset Superimposed trend might be invisible. In that case redraw your plot simply clicking once again on the preset you chose or orange „Start plotting” button
- **BEWARE:** Plotting procedure starts right after the click at the Preset which means it will take all runs that are currently specified in the **Options panel**

Choosing what you want to plot

- This panel is folded by default
 - Click on its name to unfold
- Choose trends you want to see
 - You will get an extreme value (i.e # of digis) for each run in the range
 - You can mix this with Bad Components on one plot
- Det ID Filter to check extreme behaviour of a single Tracker module:
 - When Det ID is provided algorithm checks whether given ID is among extreme valued modules:
 - If not, 0 is the output for the given run
 - Otherwise, it puts reported value in the bin

Min/Max trend selection		
	MIN	MAX
Strip		
# strip clusters		<input type="checkbox"/>
# strip digis		<input type="checkbox"/>
# off track clusters		<input type="checkbox"/>
S/N correlation on track		<input type="checkbox"/>
Residuals Mean		<input type="checkbox"/>
Pixel		
ADC	<input type="checkbox"/>	<input type="checkbox"/>
Charge	<input type="checkbox"/>	<input type="checkbox"/>
Size	<input type="checkbox"/>	<input type="checkbox"/>
# pixel clusters	<input type="checkbox"/>	<input type="checkbox"/>
# pixel digis	<input type="checkbox"/>	<input type="checkbox"/>
Track size	<input type="checkbox"/>	<input type="checkbox"/>
Track charge	<input type="checkbox"/>	<input type="checkbox"/>
Track shape filter	<input type="checkbox"/>	<input type="checkbox"/>
Track hit efficiency	<input type="checkbox"/>	<input type="checkbox"/>
Track X-residual	<input type="checkbox"/>	<input type="checkbox"/>
Track Y-residual	<input type="checkbox"/>	<input type="checkbox"/>
Rechit X-size	<input type="checkbox"/>	<input type="checkbox"/>
Rechit Y-size	<input type="checkbox"/>	<input type="checkbox"/>
# cluster on track	<input type="checkbox"/>	<input type="checkbox"/>
# track missing	<input type="checkbox"/>	<input type="checkbox"/>
# track valid	<input type="checkbox"/>	<input type="checkbox"/>
Det ID Filter	<input type="text" value="empty or eg. 353309700"/>	

Dataset selection

- Choose your runs:
 - Pass start and end run number, or
 - Pass dates of wanted runs, or
 - Switch to expert mode and create your own selector (database query)
- Switch between Beam and Cosmics data type
- PromptReco type:
 - By default: Beam -> StreamExpress, Cosmics -> StreamExpressCosmics
 - You can pass your own string to look only for example „ZeroBias” subdatasets
- If you are ready with all settings press **Start plotting**

The screenshot shows a web-based interface for dataset selection. At the top, there's a blue header bar with the word "Options" on the left and a toggle switch for "Expert mode: OFF" on the right. Below the header, there's a "Run" button. Underneath, two input boxes contain the numbers "305000" and "305897". Below these is a horizontal slider with a handle, and a scale with labels "270000", "285000", and "300000". Further down, there's a "Data type:" label followed by a red button labeled "BEAM". Below that, there's a "PromptReco type:" label followed by an input box containing "e.g. ZeroBias". At the bottom right of the main content area, there's a link that says "Need help?". At the very bottom of the interface is a large orange button labeled "Start plotting".

Dataset selection

- In time-based run range selection mode you have 2 possibilities:
 - Pick date range (start – end)
 - Pick a date and it will extract all runs in a given month (check **All runs in chosen month**)
- Expert mode:
 - For those with special needs in run querying
 - You can access all columns in *runreg_tracker.runs* with *r*
 - Reading linked [TWiki](#) page is strongly advised

Options Expert mode: OFF

Time ☐ All runs in chosen month

27/10/2017
to
31/10/2017

Options Expert mode: OFF

Time ☒ All runs in chosen month

27/10/2017

Options Expert mode: ON

Query:

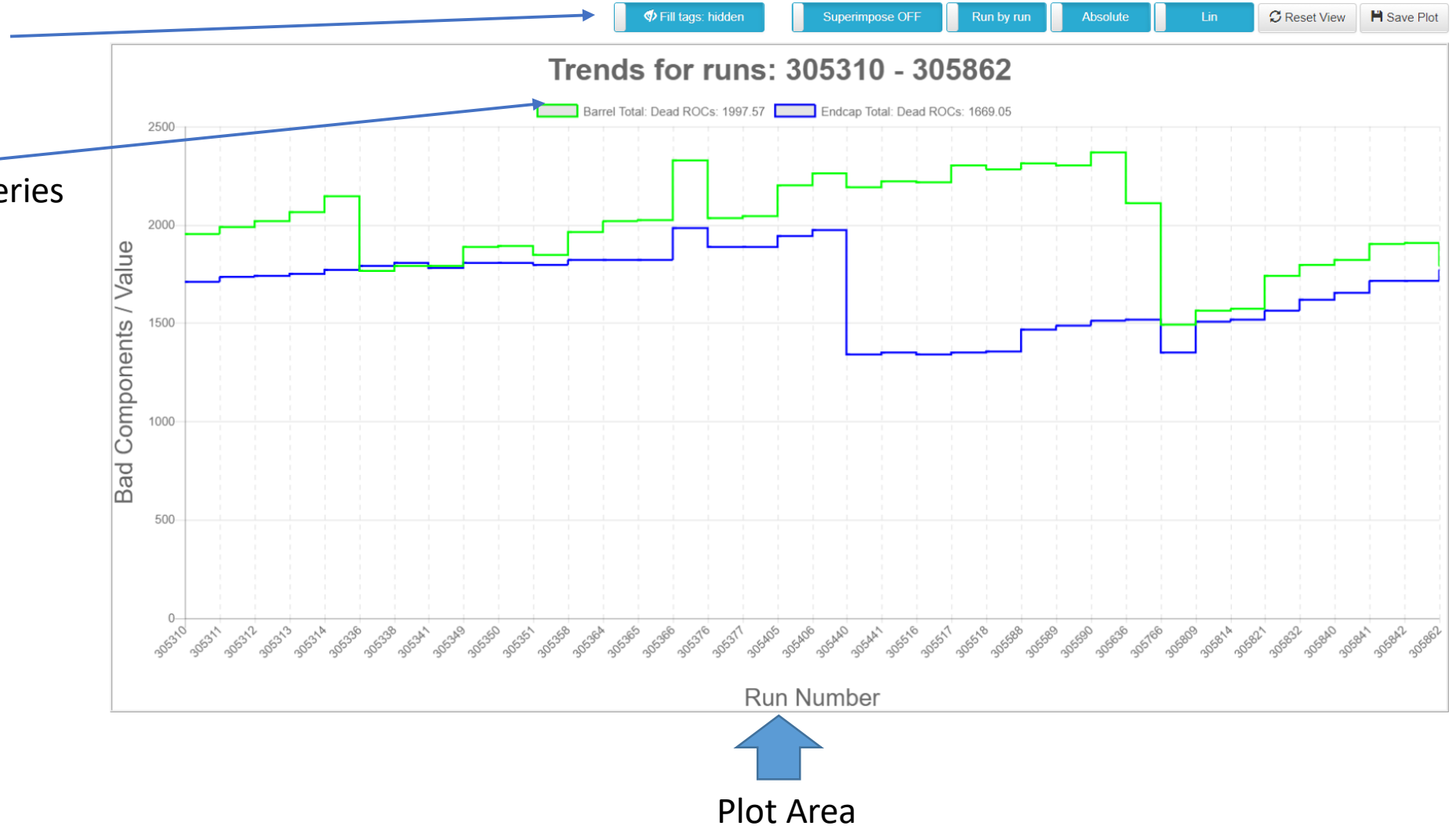
where r.runnumber between 290000 and 295000 and r.pixel_present = 1 and r.tracker_present = 1

Need help with running custom queries? Visit: [Run Registry or TWiki](#)

The Trend – the simples view

Plot switches and buttons

Data series

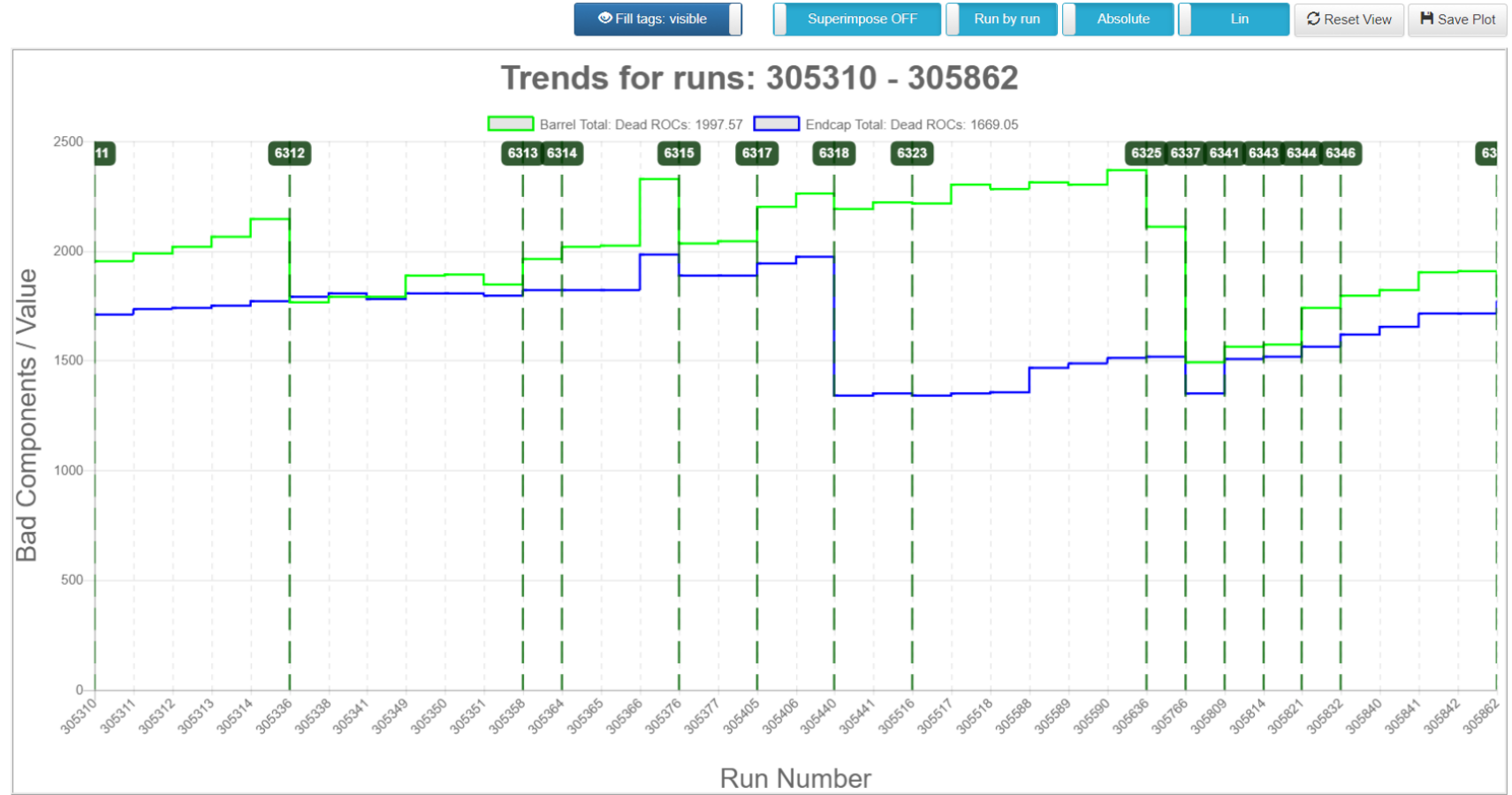


The Trend

- Basics:
 - Switches allow you to add more information to the plot, change how it looks like
 - You can mix switches as you need
- Data series:
 - Click on the data series box to hide the trend on the plot
 - The value next to the name is the mean of dataset in chosen run range

The Trend – Fill Tags

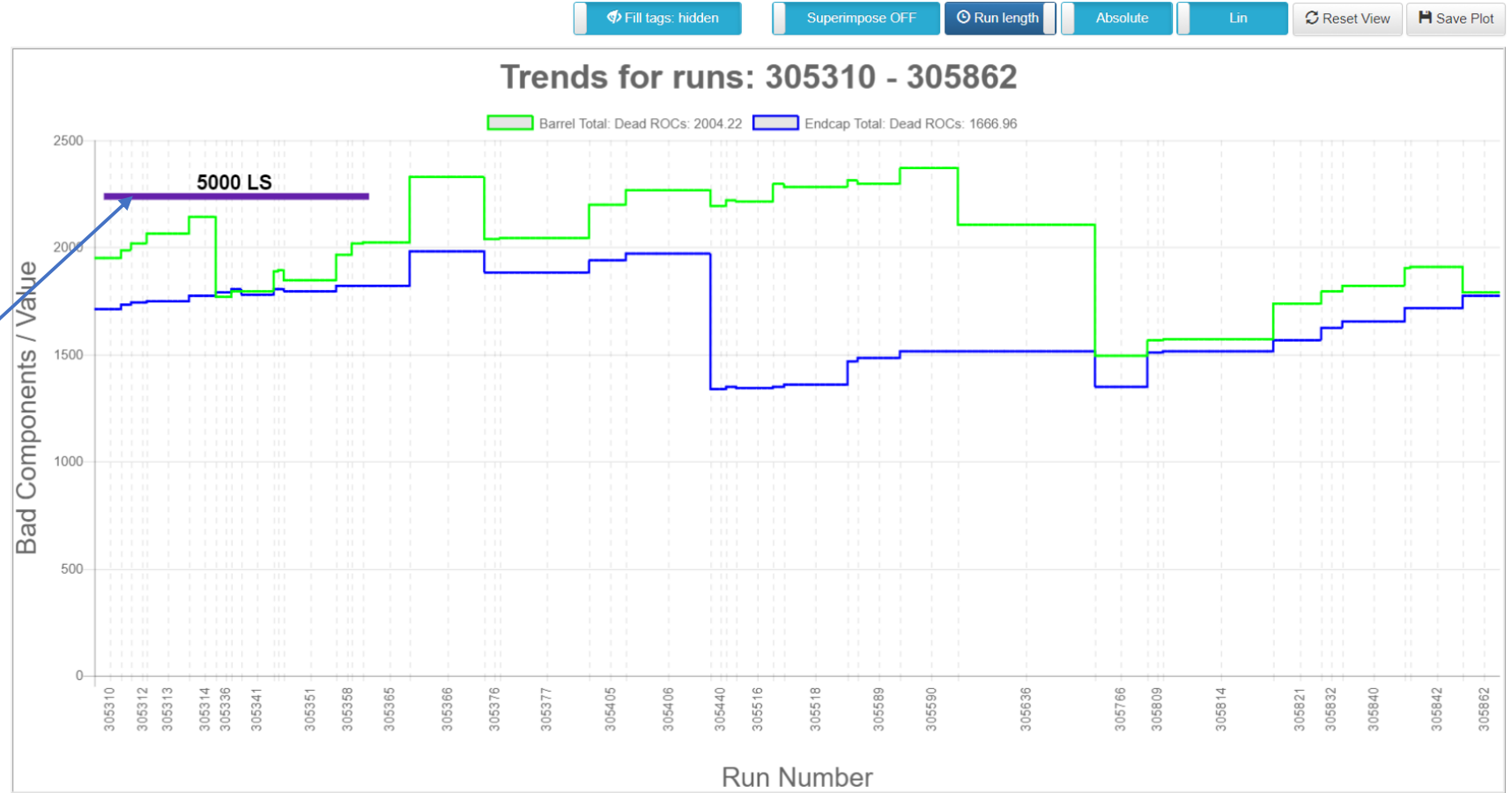
Put begin fill tag on the plot



The Trend – Run Length

If on, single run data is not a single bin anymore. The number of bins corresponds to the length of the run.

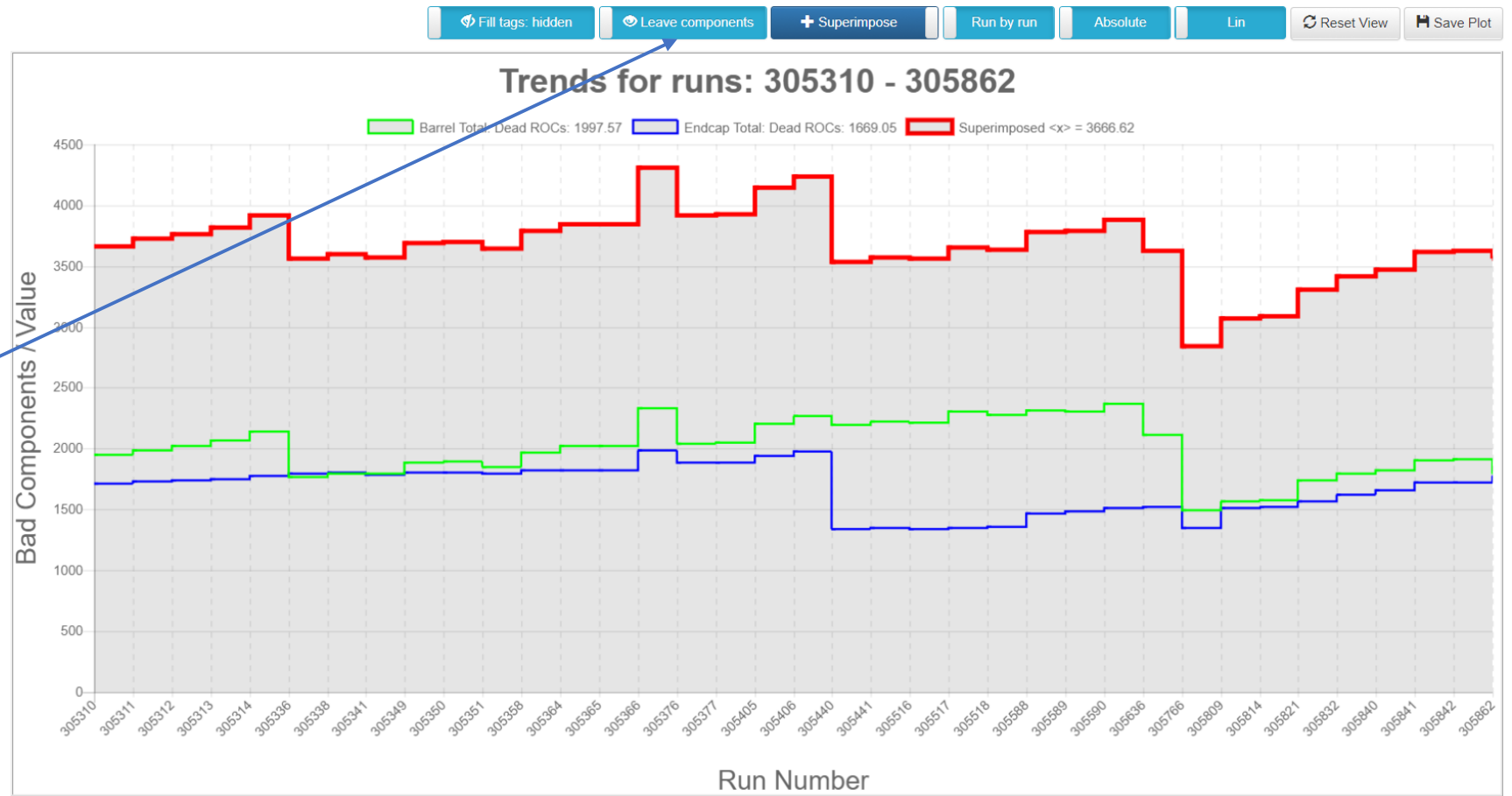
Time scale indicator



The Trend - Superimpose

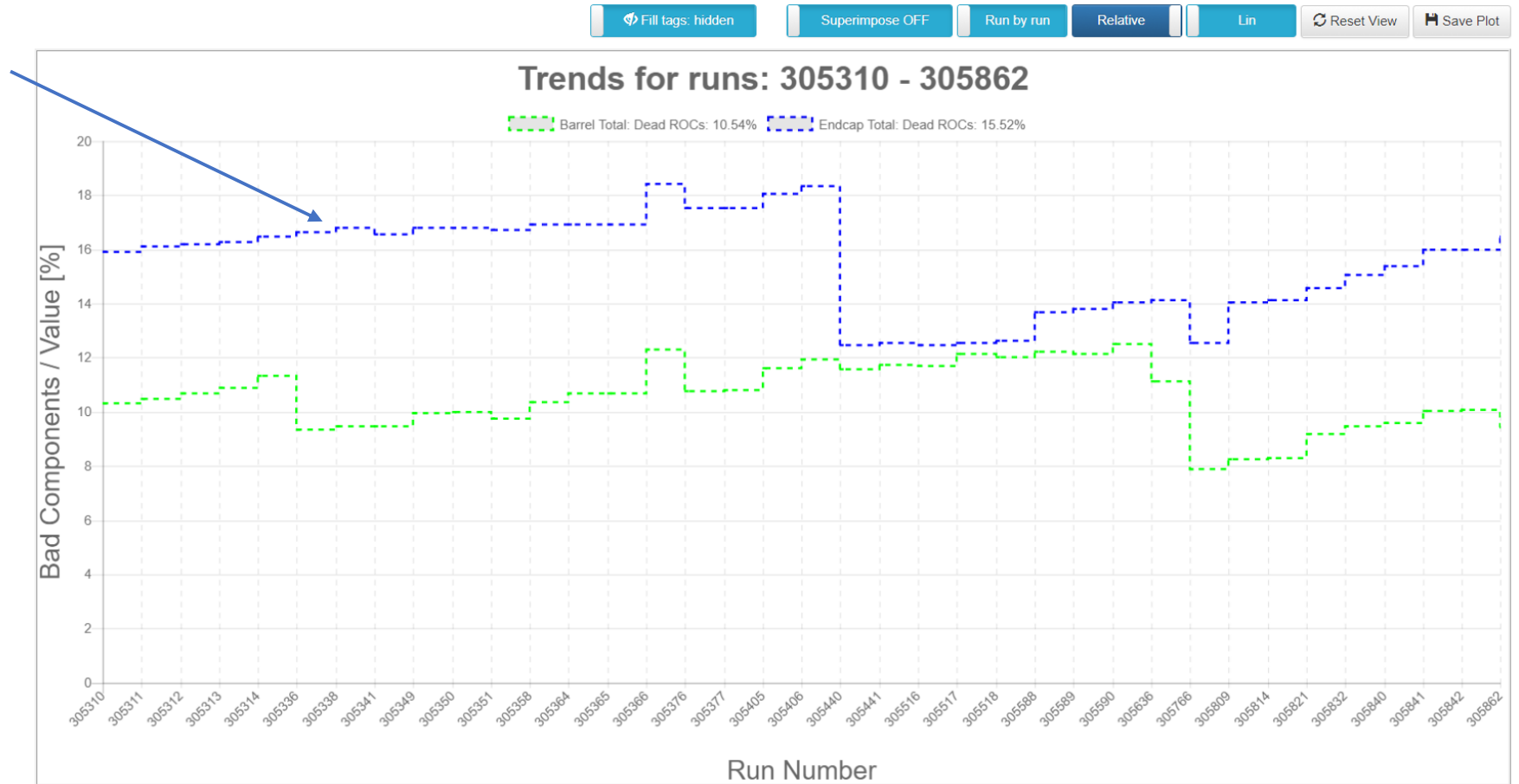
Content aware
superimposition of all
trends. Always drawn
with red line

You can decide
to collectively
hide all trends
but the
superimposed



The Trend - Relative

Relative plots are drawn with masked line

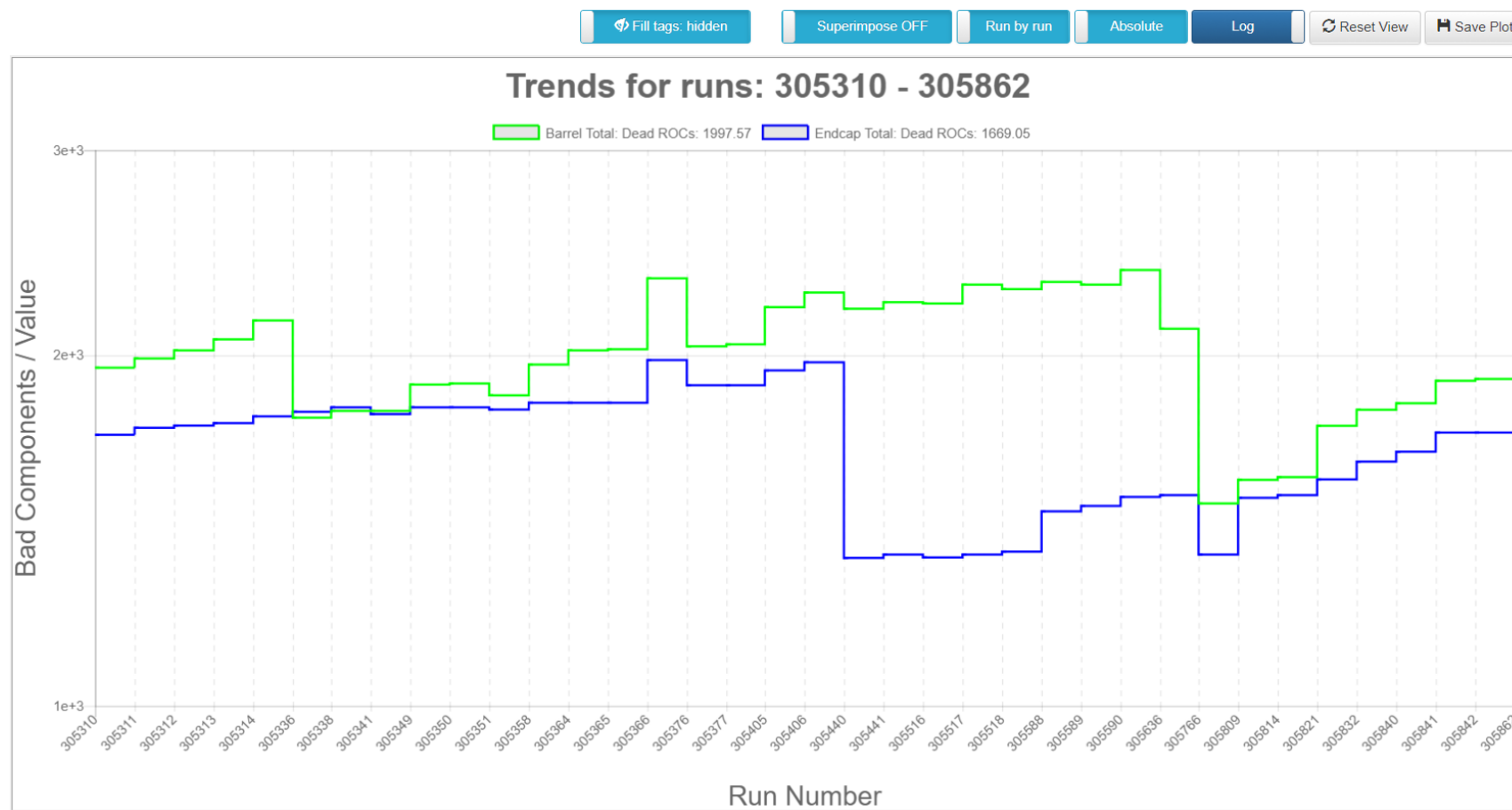


The Trend - Relative

- Trends will be turned to relative only if it is possible to know the total number of something:
 - In particular Min/Max plots can not be converted to the relative plots
- If initially there was a trend that does not have a relative representation it will not be shown
- You can superimpose trends fearlessly because this operation is content-aware
 - It is not simple summing up of %

The Trend – Lin/Log switch

Changes Y-axis data representation to linear or logarithmic



The Trend - Buttons

- Reset View
 - If the plot started to look akward or you just want to switch to the fresh plot click on this button
- Save Plot
 - Save current canvas to the drive as png

Final notes

- **NOTE:** It may happen that the tool looks strange and is not responding:
 - If you have chosen long run range (> 2000) wait for your results, or
 - Run Registry server is down or it is other Run Registry-related problem
- If you experience problems using this tool or have some suggestions write an email: pawel.jurgielewicz@cern.ch