

Study of Recent Beam Monitoring Problems.

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Overview

- **Since the return of the NuMI beam on 23rd August 2010, there have been problems with beam monitoring data uploaded to the MINOS offline database.**
- **Summary of problem: a large fraction of beam monitoring data is currently missing from MINOS offline database, and therefore not available for physics analysis.**
 - In many cases, the missing data will need to be recovered from the ACNET logs (somehow...).
- **To study the problem, search for gaps in the database by correlating beam monitoring entries ('beam spills') with near detector triggers ('ND spills').**
 - Near Detector triggers stored in MINOS offline database.
 - ◇ Source: MINOS DAQ (independent of beam monitoring).
 - Search for missing data by identifying near detector spills with no associated beam monitoring data.

Method

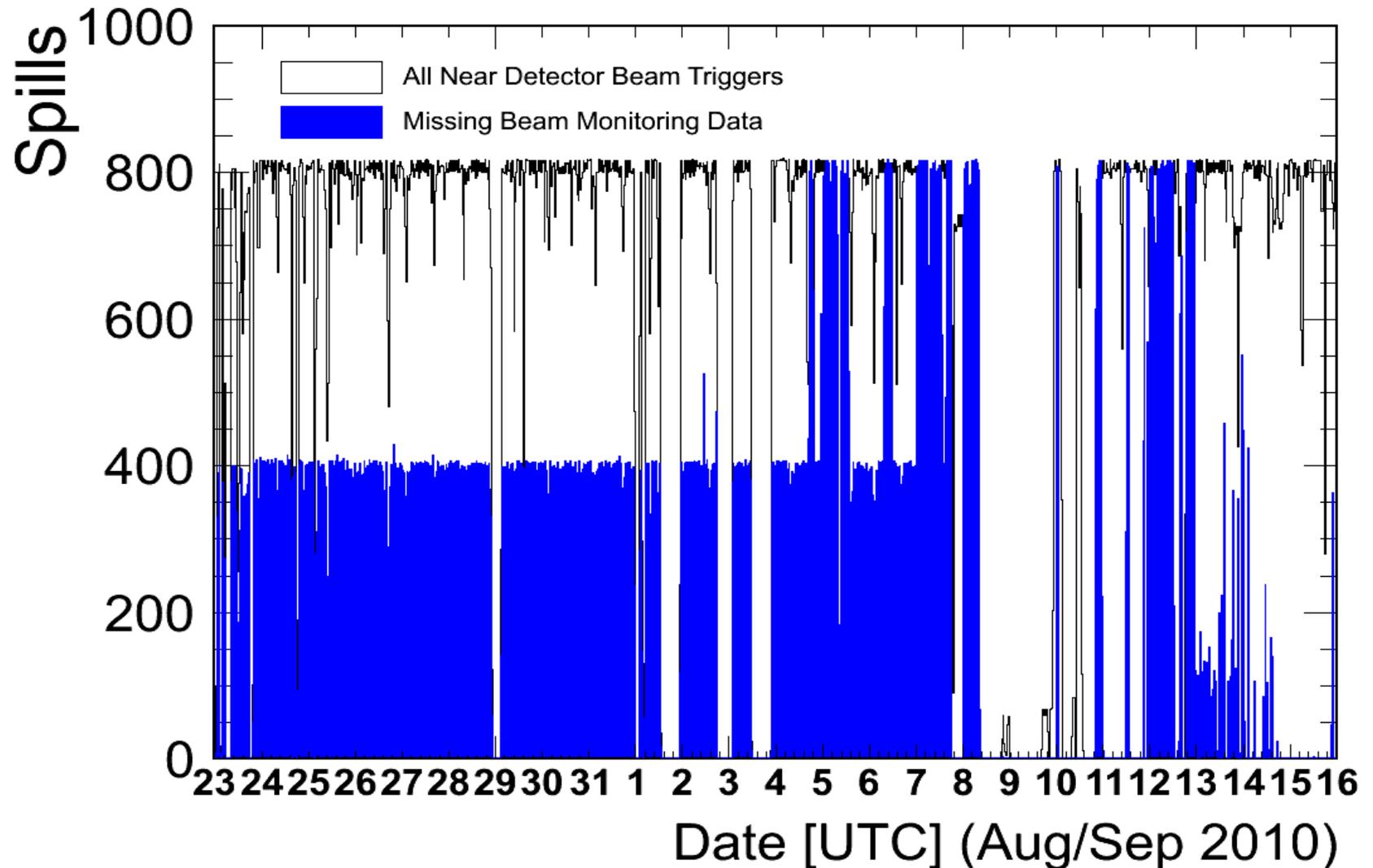
- **Cross-check beam monitoring (BeamMonSpill DB table) using near detector triggers (SpillTimeND DB table).**
 - Assume that SpillTimeND record is complete, with no gaps!
 - Assume that each ND trigger should be accompanied by a beam monitoring record.
 - Count fraction of ND triggers with associated beam record.
 - ◇ Use time difference of 1 second to make association.
 - ◇ Note: time window is 2s, but spills separated by 2.2s. Should check that nothing is hiding in the 0.2s gap!
 - No beam or data selection cuts are applied: use all data.
- **Current data set used in study:**
 - Start Time: 2010-08-23 00:00:00 [UTC].
 - End Time: 2010-09-16 00:00:00 [UTC].

Summary of Results

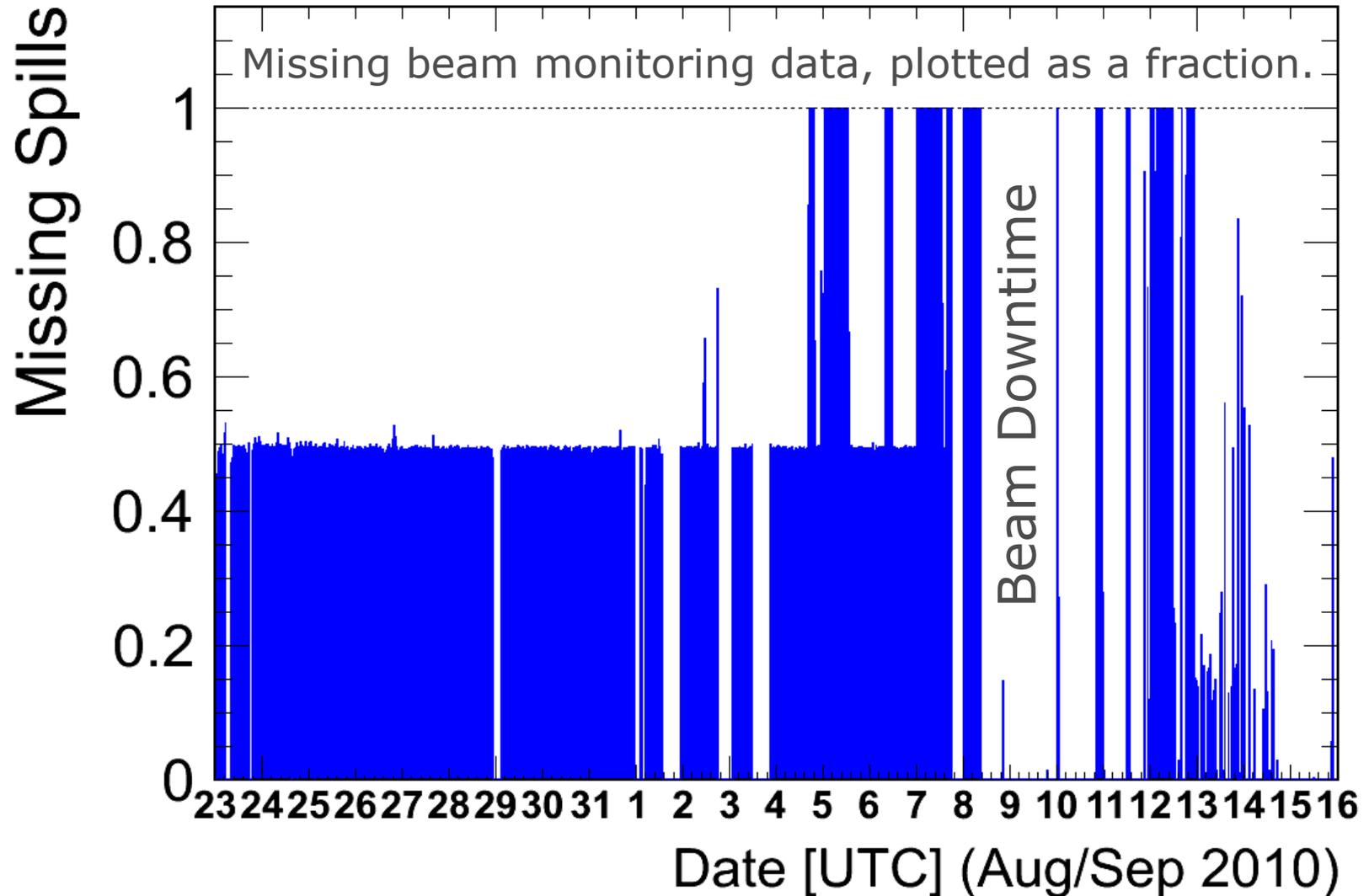
- **Significant fraction of beam data missing!**
- **Summary of missing beam data:**
 - Between 23rd August and 7th September:
 - ◇ Intermittent losses:
 - Roughly every other beam spill is missing!
 - Between 7th September and 14th September:
 - ◇ Continuous losses:
 - Long gaps in available beam monitoring.
 - Some normal running too (with no losses).
 - From 14th September onwards:
 - ◇ Almost back to normal... but still some losses.
- **Results are plotted in following slides.**

Note: switching point between 'intermittent' and 'continuous' mode seems to be 7th Sept at ~10am CST.

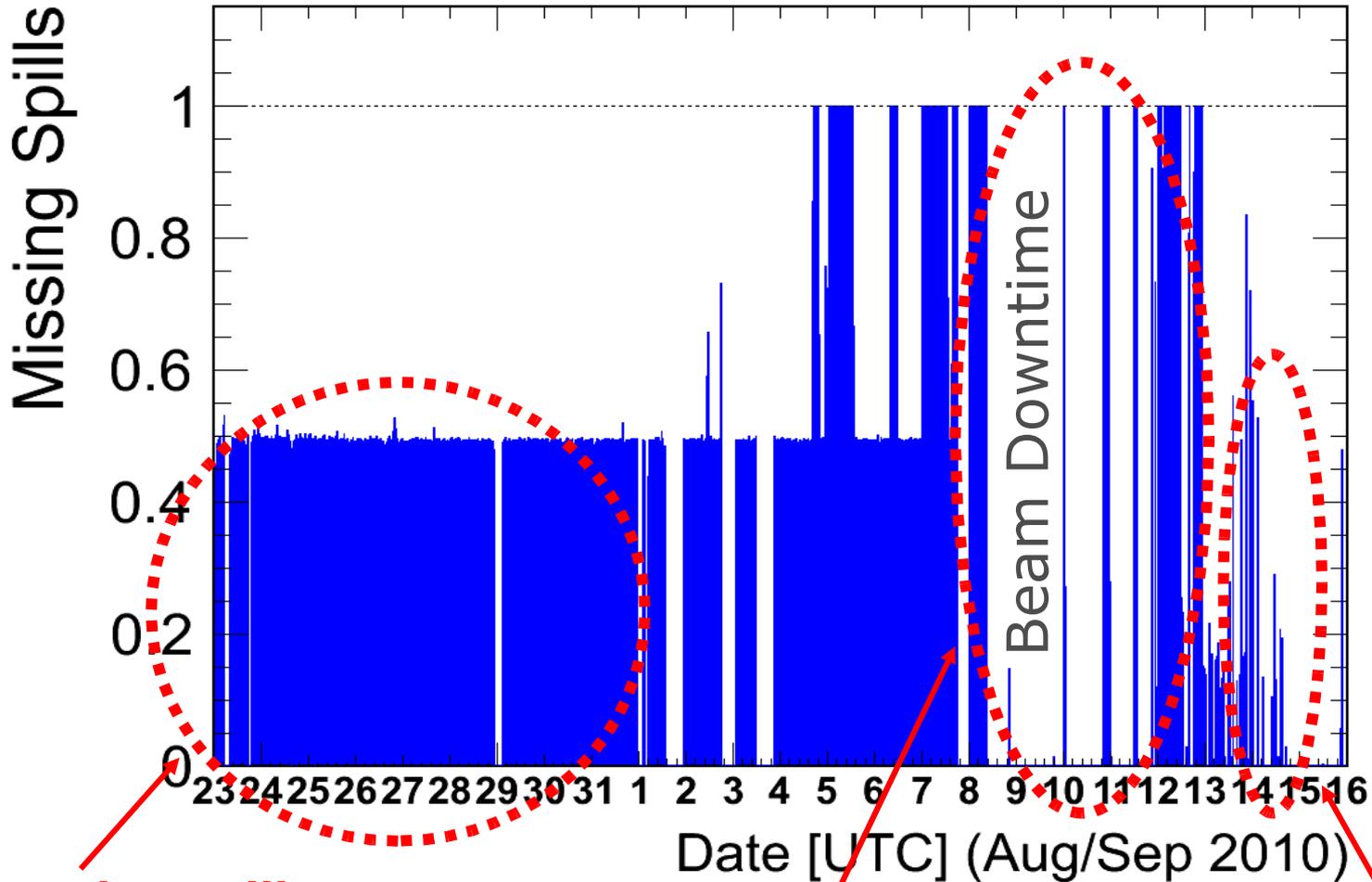
Missing Beam Monitoring Data



Missing Beam Monitoring Data



Missing Beam Monitoring Data

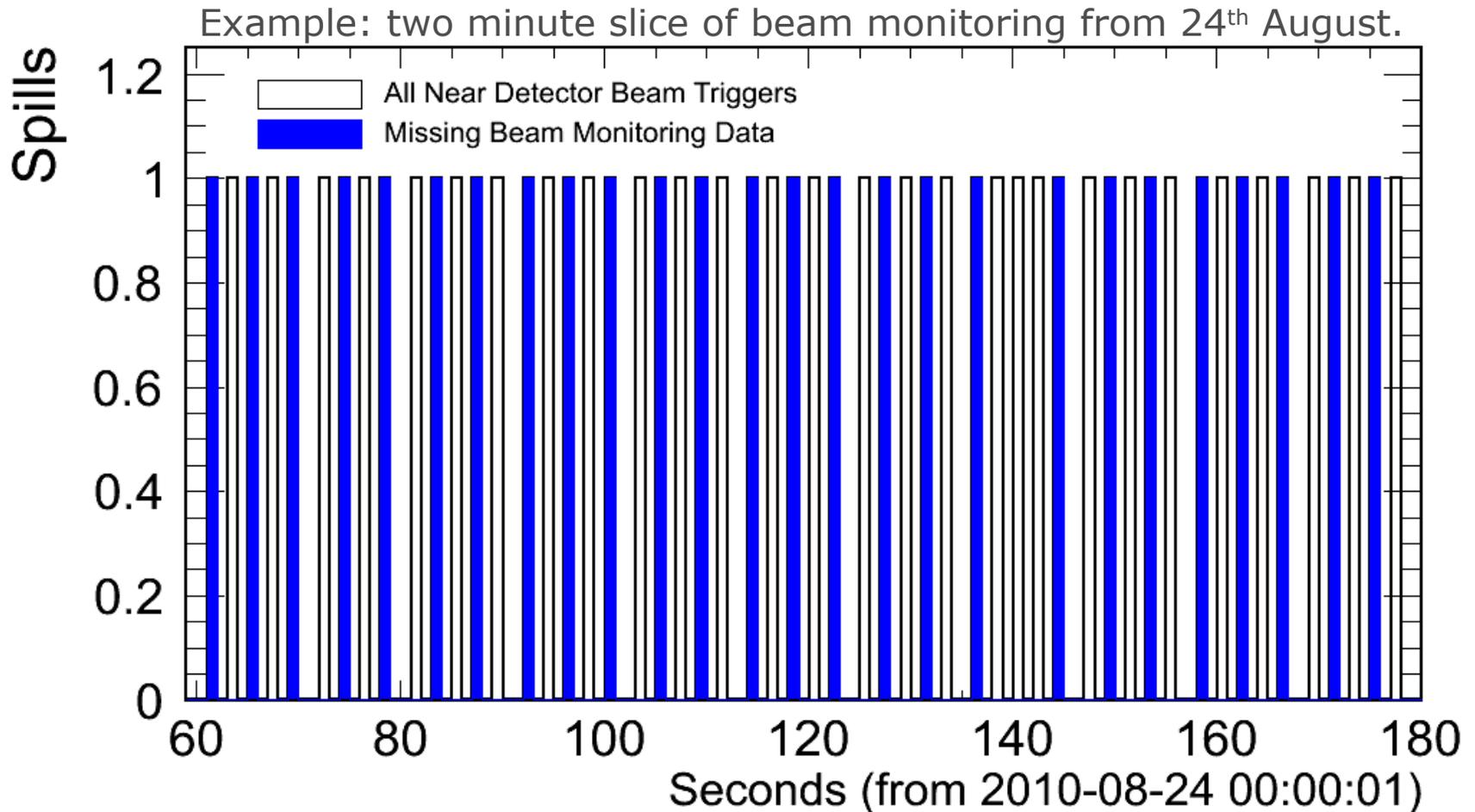


**Every other spill
is missing!**

Long gaps...

Short gaps...

Zoom in on Intermittent Data



From 23rd August to 7th September:
(Roughly) every other spill missing from beam monitoring records...