

EMCal Interface Board Currents

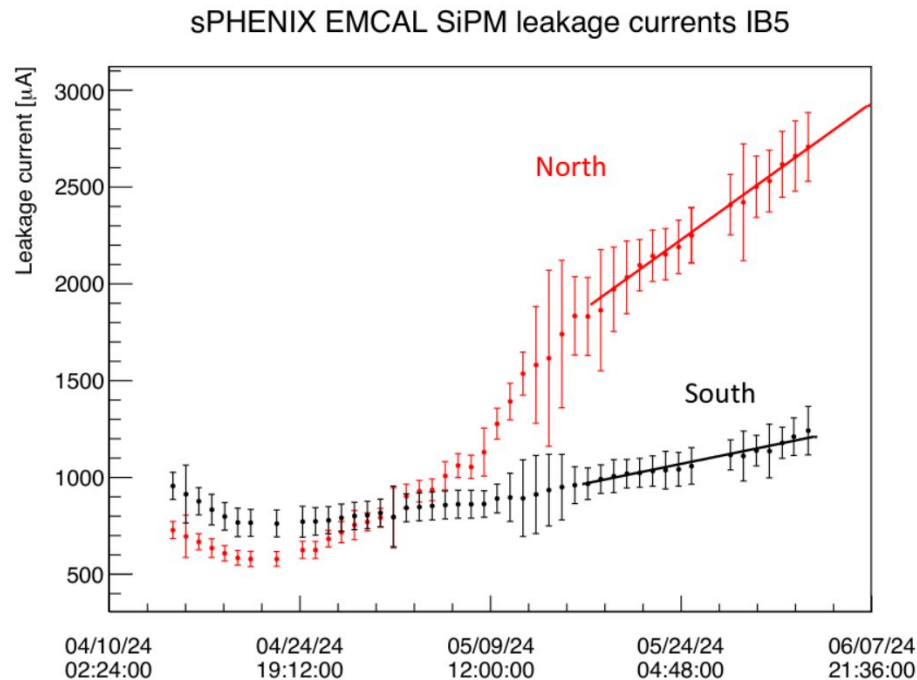
Apurva Narde

UIUC

6/13/24

Overview

- Asymmetry in the interface board (IB) currents between the north and south side of the EMCal observed
- Understand the currents as a function of eta/phi over time



Plot by John Haggerty

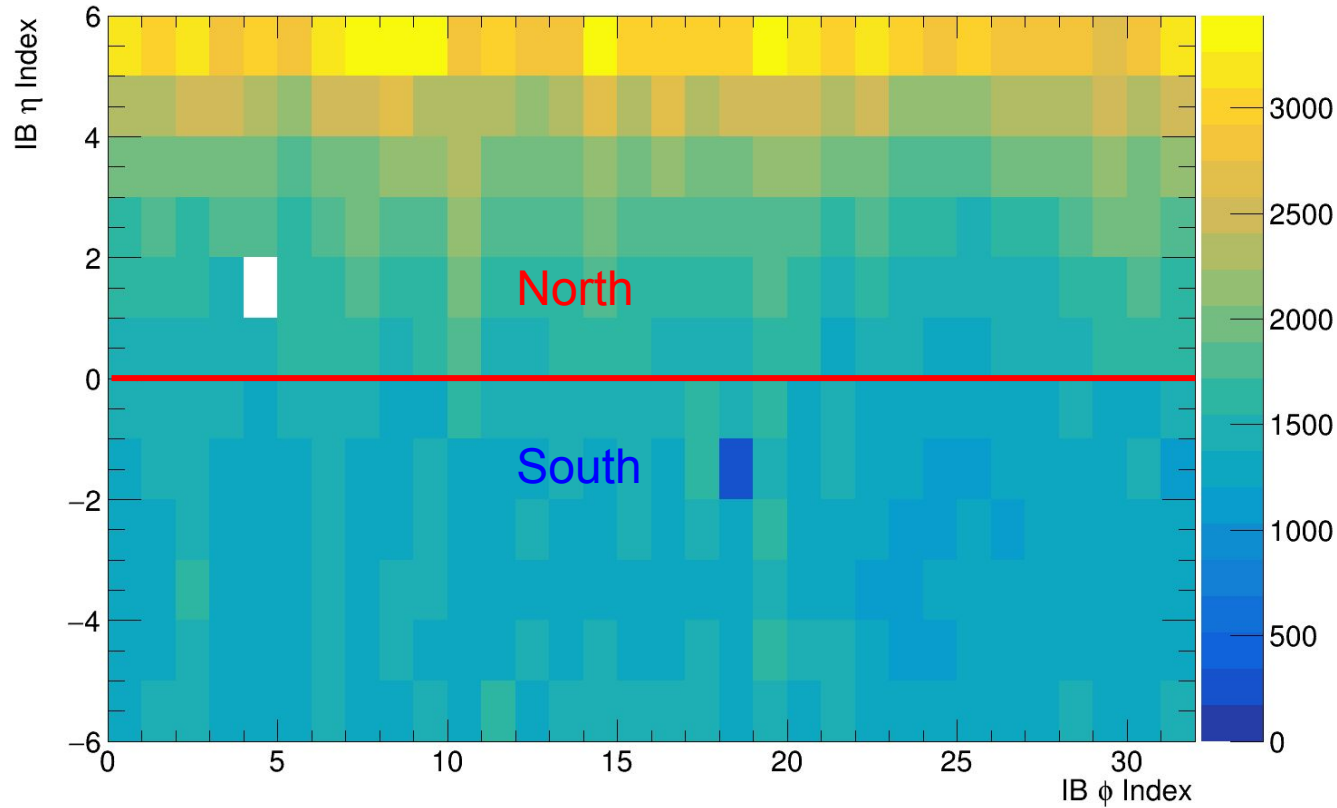
IB Current Extraction

- The daq database contains “emcal_mpodlog” table that logs the IB current every 2 minutes.
- “imeas” is the IB current in units of μA

readtime	sector	ib	vmeas	vset	imeas
2024-06-13 10:00:49.845823	7	0	66.50174	66.5	1667
2024-06-13 10:00:49.845823	7	1	66.501236	66.5	1803
2024-06-13 10:00:49.845823	7	2	66.50121	66.5	1952
2024-06-13 10:00:49.845823	7	3	66.49784	66.5	2036
2024-06-13 10:00:49.845823	7	4	66.50348	66.5	2549
2024-06-13 10:00:49.845823	7	5	66.49404	66.5	3437
2024-06-13 10:00:49.845823	6	0	66.50116	66.5	1584
2024-06-13 10:00:49.845823	6	1	66.49372	66.5	1557
2024-06-13 10:00:49.845823	6	2	66.502365	66.5	1807
2024-06-13 10:00:49.845823	6	3	66.498985	66.5	1979

IB Current

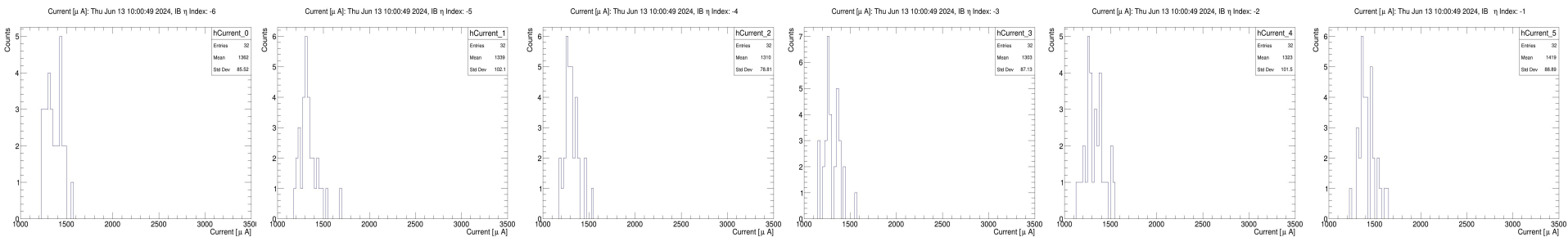
- 384 IB boards (12 x 32)



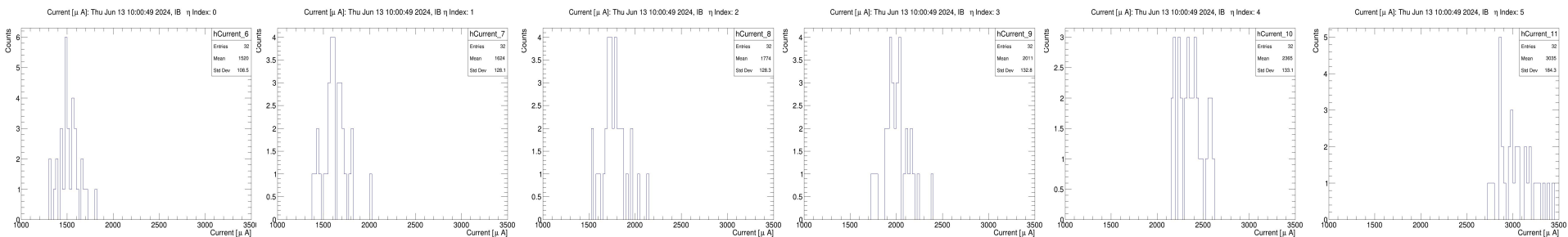
- Observe the asymmetry in the IB current at the present time

IB Current over the IB η Index

South

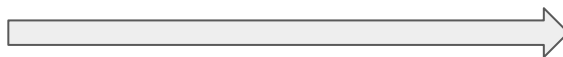


North



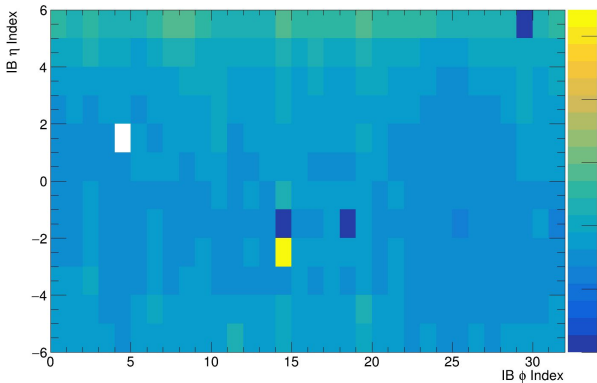
IB Current over time

Time

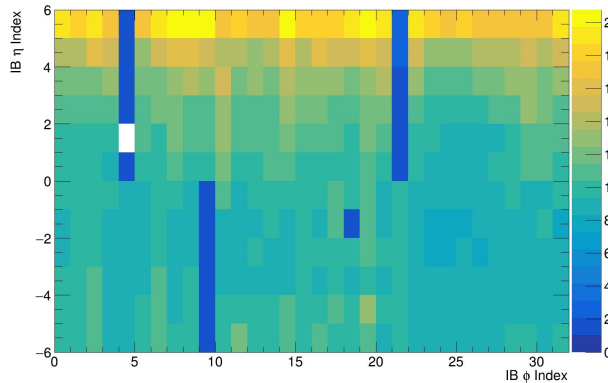


Present

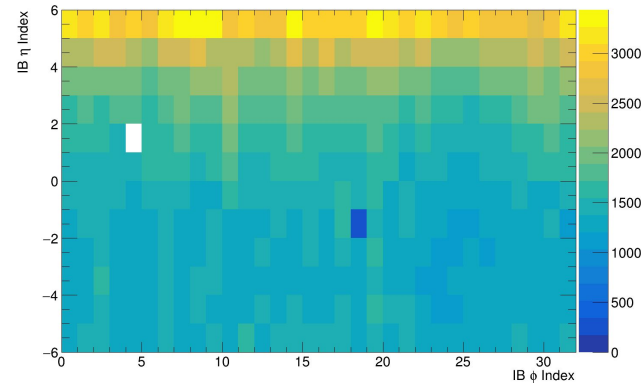
Current [μ A]: Thu May 9 18:54:49 2024



Current [μ A]: Tue May 14 17:44:50 2024

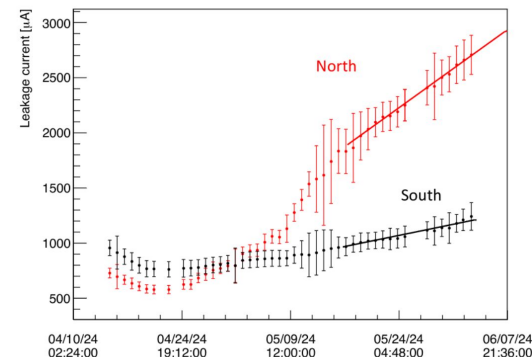


Current [μ A]: Thu Jun 13 10:00:49 2024



- We can see the asymmetry in IB current between the north and south part of EMCal grow over time.

sPHENIX EMCAL SiPM leakage currents IB5



Backup

Interface Board Current Extraction

select readtime, sector, ib, vmeas, vset, imeas

from emcal_mpodlog

where $\text{abs}(\text{vmeas} - \text{vset}) < 1.5$

and $\text{vmeas} \neq 0$ and $\text{vset} \neq 0$

order by readtime desc

limit 10;

readtime	sector	ib	vmeas	vset	imeas
2024-06-13 10:00:49.845823	7	0	66.50174	66.5	1667
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Value of imeas is only valid when difference between v_{meas} and v_{set} is within a threshold

Ensure that v_{meas} and v_{set} is nonzero

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