INTT日本語ミーティング

Tuesday 17 Dec 2024, 15:30 → 17:30 Asia/Tokyo

Description *Meeting URL

Zoomミーティングに参加する https://zoom.us/j/93991701519

ミーティングID: 939 9170 1519 ワンタップモバイル機器 +13462487799,93991701519#米国 (Houston) +16699006833,93991701519#米国 (San Jose)

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+1 346 248 7799 米国 (Houston) +1 669 900 6833 米国 (San Jose) +1 929 205 6099 米国 (New York) +1 253 215 8782 米国 (Tacoma) +1 301 715 8592 米国 (Washington DC) +1 312 526 6799 米国 (Chicago) +81 3 4578 1483 日本 +81 363 628 317 日本 +81 524 564 439 日本 ミーティングID: 939 9170 1519 市内番号を検索: https://zoom.us/u/adlmUqtJ8b

15:30	→ 15:45	コミュニケーション等
		Speaker: radiab phenix (riken)
15:45	→ 16:05	pp データのMIP ピーク解析 Speaker: Yui Ishigaki (NWU)
16:05	→ 15:25	Cluster Phi Size Issue Speaker: Manami Fujiwara
		区 20241217INTT日本
16:25	→ 15:45	INTTワークショップについて
		Speakers: Mahiro Ikemoto, Yui Ishigaki [20241217_INTT日

INTT 日本語ミーティング 2024/12/17



ミーティング日程:毎週火曜日 15:30~



2025 年の BNL 滞在予定

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9	RIKEN	Yasuyuki																								
10	RIKEN	Itaru													JPS											
11	RIKEN	Genki																4/2								
12	RIKEN	Akitomo															3/30									
13	RIKEN	Yuko															3/30		QM?							
14	RIKEN/NCU	Chang-Wei			TPS 1	/13-2/1													QM?							
15	NWU	Takashi																	QM							
16	NWU	Maya																								М
17	NWU	Manami																not a	wailat							
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19	NWU	Hinako																not a	vailat							
20	NWU	Nao																								
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29	Rikkyo	Yusuke																not a	vailat							
30	JAEA	Shoichi																								
31	NCU	Chia-Ming																								
32	NCU	Kai-Yu																								
33	NCU	Wei-Che																								
34	NTU	Rong-Shyang																								
35	NTU	Lian-Sheng																								
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韓国ワークショップ中に現地のスタッフで構想を描いてみました。おおよそこのような動きでいくと思います。



BH	BI	ВJ
12		
3	4	5

2025/04/06 — 12 ドイツ・フランクフルト

発表予定

- ・ポスター、奈良女の誰か:2024 データ (pp, AuAu) パフォーマンス
- ・トーク、?: $dN/d\eta$

ジョセフやらない

Quark Matter 2025



一般講演の申し込みは 12/17 (今日) ~ 01/09 です。 発表者やテーマを考え始めましょう。 発表予定

- ・ 宍倉:検出効率
- ・加藤: $dN/d\eta$
- · 菊池:?

学会に入会していない人は入会手続きを早めに始めましょう。 奈良女からの発表はありますか?







- ・企画提案 (受付中~11/21)
- ・一般講演(12/17~01/09)
- ・会合IM(12/17~01/21)

※概要原稿(PDF)送信は02/14締切

RIKEN Accelerator Progress Report (APR)

修士以上の人で、理研から出張費などの経済的サポートを 受けた人は全員、APR にレポートを提出してもらうことに なっています。

- ・締め切り:毎年1月半ば
- ・ 分量:A41枚
- ・言語:英語

早めにテーマを決めて書き始めましょう。 2025/01/10 ドラフト (ver1) を目指しては? 先週の INTT ミーティングで、トピックの 取りまとめは誰がするのか議論しましたが, 中川さんが適当だと思います。



- 2024 スピンコーディネーターについて?
- INTT streaming readout 蜂谷
- 榎園 2024 INTT AuAu コミッショニング
- 2024 INTT pp コミッショニング 糠塚
- 2024 sPHENIX pp データ収集 • 糠塚2
- 2024 pp, シリコンシーディング + sEPD で 2 粒子相関 • 関口
- 無し • 熊岡
- ? ・ジョセフ

• 中川

- チェンウェイ 2023 (2024) dN/dη?
- ・ジェイン ?
- INTT 検出効率(宇宙線)? • ウェイチェ
- 加藤 2024 pp cluster z サイズ解析(進捗があれば dN/dη)
- M2 → 宍倉 2024 pp, AuAu offline QA クラスターサイズ解析 + INTT 検出効率(pp)
 - イベントミックスアップ? • 加納
 - 2023 (2024?) INTT v₂? 藤原
 - 2024 pp INTT (+EMCal) トラッキング? 辻端
 - Vernier Scan 解析 • 菊池
 - INTT vertex? 池本
 - DACO スキャン 森本
 - INTT Grafana? 2024 pp MIP? •石垣





RIKEN Accelerator Progress Report (APR)

著者リスト生成スクリプトを作りました:

https://github.com/sPHENIX-Collaboration/INTT/tree/main/RIKEN_APR 間違いがあったら教えて下さい。

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	Who are you? Type your family name (eg. Nukazuka	i) > Nukazuka						
	then the author list for you is shown on yo	our terminal:						

G. Nukazuka,^{*1} Y. Akiba,^{*1} J. Bertaux,^{*2} D. Cacace,^{*3} R. G. Cecato,^{*4} A. Enokizono,^{*1} Y. Fujino,^{*1*5} M. Fujiwara,^{*6} T. Hachiya,^{*1*6} T. Harada,^{*1*5} S. Hasegawa,^{*1*7} B. Hong,^{*8} J. Hwang,^{*8} M. Ikemoto,^{*6} Y. Ishigaki,^{*6} M. Kano,^{*6} T. Kato,^{*1*5} T. Kikuchi,^{*1*5} T. Kondo,^{*9} C. M. Kuo,^{*10} R. S. Lu,^{*11} N. Morimoto,^{*6} I. Nakagawa,^{*1} R. Nouicer,^{*3} I. Omae,^{*6} R. Pisani,^{*3} Y. Sekiguchi,^{*1} C. W. Shih,^{*1*10} M. Shimomura,^{*6} R. Shishikura,^{*1*5} W. C. Tang,^{*10} H. Tsujibata,^{*6} X. Wei,^{*2} and H. Yanagawa^{*1*5}

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<pre>\INSITUTE[3](Frysics Department, Brocknaven National Laboratory) \INSITUTE[3](A structure for the first in the formation of the structure of the structure</pre>	
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(INSITUTE(10) (Department of Physics, National Central University)	
\INSTITUTE(11)(Department of Physics, National Taiwan University)	

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- *11 Department of Physics, National Taiwan University





RIKEN Accelerator Progress Report 2023 年度

GRAVURE リンク

FEATURE ARTICLE

The sPHENIX experiment at RHIC and the INTT silicon detector

The sPHENIX experiment at RHIC and the INTT silicon detector

Y. Akiba,*¹ A. Enokizono,*¹ T. Kondo,*² C. M. Kuo,*³ T. Hachiya,*⁴ S. Hasegawa,*⁵ B. Hong,*⁶ R. S. Lu,*⁷ I. Nakagawa,*^{1,*8} R. Nouicer,*⁹ G. Nukazuka,*¹ M. Shimomura,*⁴ and X. Wei*¹⁰

The sPHENIX experiment is a new experiment di its new detector of Relativistic Heavy Ion Col-ler (RHIC). The construction of the sPHENIX de-ctor was completed by April of 2023 and its new tector subsystems were commissioned using $\sqrt{s_{NN}}$ 200 GeV Au + Au collision. The Lananese struction and operation of a silicon tracker , which is one of three tracking detectors of the mplex. The INTT detector s nce from th ng data. The sPHENIX experiment will Au + Au collision data at $\sqrt{s_{NN}} = 200$ GeV in

When two heavy atomic nuclei collide at high energy, new form of matter with very high energy density of temperature is formed. This matter is called quark non plasma (QGP). It was discovered that QGPs are oduced in collisions of heavy atomic nuclei such as at + Au collisions at RHIC in Brookhaven National boratory (BNL). Later it was confirmed that QGPs a lass produced in nuclear collisions at the Large dron Collider (LHC) in CERN. The properties of OGP are currently being investigated at RHIC and estigated at RHIC and

nd its detector at RHIC. It is an upgrade of PHENIX experiment.³⁾ The sPHENIX is to com-e the scientific mission of RHIC in study of QGP

Sciences, Nara spin, as illustrated in the bottom left image of Fig. 1

KEN Accel. Prog. Rep. 57 (2024)



n cable. The ered flexible circuit cable and the line ata lines are both 60 μ m. The bus extender cable crystal as a dielectric material to suppress losses in transmission lines. The conversion cable consists of three components: 1) µ-coaxial cables, 2) power and ground cables, 3) connector print boards both ends. The downstream of the conversion cable is connected to the read-out card (ROC), which collects data from multiple half-ladders and transmits reformatted data further downstream to the Felix server through an optical fiber link. The ROC was reused from the FVTX detector in the PHENX experiment⁹) to reduce the cost of the INTT project.
 Depicted in Fig. 8 is the INTT barrel detector installed inside the TPC detector in the PHENX elector in the PHENX experiment⁹) to reduce the cost of the INTT project.
 A material and the transmits and the transmits and the interment of the transmits and the transmits crystal as a dielectric material to suppress losses in INTT project was thus conducted mainly by RIKEN

the sector of the first sector of the secto

perature of the QGI ement of jet substructure and the study of parton–QGP interaction (4) Study of the spin structure of the proton

High-energy partons (quarks or gluons) lose the tons with the QGP me e hadron jets, high transverse r mentum (p_T) hadrons, and high-energy photons o posed into a b and \bar{b} pair in a hot QGP. The light of the heavier upsilon provide ture of the QGP generated at the RHIC The RHIC is the only polarized proton collider i

e world. By colliding pola other at high energies, one can study how the spin of Measurement of narron jets, direct photons, and heavy quarks and study of parton energy loss in the QGP Measurement of the Upsilon particles and tem-measurement of the Upsilon particles and tem-tiken Nishina Center koyo Metropolitan Industrial Technology Research Insti-te ent of Physics, National Central University enter for High Energy and High Field Physics and Depar-ter of Physics, National Central University enter for High Energy and High Field Physics and Depar-ter of Physics, National Central University enter for High Energy and High Field Physics and Depar-ter of Physics National Central University enter for High Energy and High Field Physics and Depart.







2 sPHENIX Detector

The ${\rm sPHENIX}^{2)}$ is a new state-of-art jet detector at ction of the detector complex pleted by the end of April 2023 as shown in . 4.^{b)} The concept of sPHENIX follows the geom-v of typical collider detectors, depicted in Fig. 5,

overing the full azimuth and pseudo rapidity rar of $-1.1 \le \eta \le 1.1$, with a tracking system consisting of a pixel detector (MVTX) based on monolithic ac tracker (INTT), and a time projection chamber (TPC The calorimeter stack includes a tungster fiber electromagnetic calorimeter (EMCAL) and steel/scintillator tile hadronic calorimeter (HCAL), d rided into inner and outer parts. The inner HCAL sit ducting solenoid, which was r

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40 20 0 100 200 300 400 500 600 700

alive amongst 373k total channels. The signals ob-

served by the INTT detector were certainly corre-lated with a given collision, which can be proven by

Di-Photon Mass [ADC]





ng of the MVTX, the INTT, and the TPC is the well-es as STAR⁶) and ALICE.⁷) Each detector is excel vely and, thus, an e A minimum bias trigger is provided by the pair of tream of the collision point along a beam pipe in tiles. The EPD prov

in the event plane resolution of the . signed to handle a trigger rate of 15 kHz. The Fe lix server system developed in $ATLAS^{(8)}$ was employe as a part of the DAQ system for tracking detectors

a enables the processing of data in a stream read ode as well.

3 INTT Silicon Detector and Japanese Con

el-type INTT detector²⁾ c overs of INTT ladders in the egion of 7 to 10 cm from the beam line. The adja tween them and form inner an er barrels from 24 and 32 ladders, as depicted i



Fig. 6. INTT half barrels

Methods Phys. Res. A **1048**, 167994 (2023). C. Aidala *et al.*, Nucl. Instrum. Methods Phys. Res. A

755, 44 (2014).
T. Kondo *et al.*, Trans. Jpn. Inst. Electron. Package

I. Nakagawa *et al.*, in this report. G. Nukazuka *et al.*, in this report



be achievable by removing timing jitters be FELIX servers. The solution of upgrading th ton collision starting in May, 2024. The INTT and other subsystem detectors thus demonstrated excellent performance and accumulated reasonably high-quality data even in the commissioning period. Certain work-ing groups have been launched for several physics top-ics animg for physics publications in ambition from Run23 data. The INTT was one of the most advanced where to detect are in Energy consistence Weares subsystem detectors in Run23 commissioning. We are ambitious to publish the analysis results of the charged particle distribution as a function of rapidity $(dN/d\eta)$ using the INTT tracklets.

 $\begin{array}{c} \label{eq:constraint} \begin{array}{c} \mbox{....} & \mbox{out} \mbox{ interms} \mbox{ and spa} \\ \mbox{....} & \mbox{ous} \mbox{ extender of 120 and 120 } \mbox{ and spa} \\ \mbox{connector end design to be compatible with the in-$ put ports of the ROC. Therefore, another 15 to 25 cmadapter cable, that is, the conversion cable, was de-veloped to interconnect between the bus extender andthe ROC. To guide the conversion $\\ \begin{array}{c} \mbox{connector end design to be compatible with the in-$ put ports of the ROC. Therefore, another 15 to 25 cm $\\ \mbox{equations ensors is amplified} \\ \mbox{equations ensors is amplified} \\ \mbox{equations ensors is amplified} \\ \mbox{equations ensors is any list of the ROC. To guide the conversion$ $\\ \mbox{equations ensors is any list of the ROC. To guide the conversion$ $\\ \mbox{equations ensors is any list of the ROC. To guide the conversion$ $\\ \mbox{equations ensors is any list of the ROC. To guide the conversion$ $\\ \mbox{equations ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. To guide the conversion ensors is any list of the ROC. The ROC and the$ BOC flevibility in of the down The INTT det

- S4 -



Fig. 9. The INTT collaboratio



Fig. 10. Event display of the EMCAL (yellow), the Inner (red), and the Outer (blue) HCAL observed in \sqrt{s} = 200 GeV Au + Au collision. The length of the bar is proportional to the energy deposit measured by each calorimeter tower.

CAL is depicted in Fig. 11. Although there is still room a clear correlation in the multiplicity with other deter CAL's sepacted in r.g. 11. Anologization test is all norms of the transmitteneous the multiplicity with our multiplicity with our multiplicity with the m which implies that the LarCAL is functioning prop-erly. The commissioning of tracking detectors was also pursued in parallel to that of calorimeters. The INTT detector was successfully commissioned as well as other subsystem detectors and appeared in 98% channels

RIKEN Accel. Prog. Rep. 57 (2024)



- a 435, 605 (2005), C. Committe al., arXiv:1710.02116 [physics.ins-det] (2018).
 7) The ALICE Collaboration, CERN-LHCC-2012-013/ LHCC-P-005, ALICE-UG-002 (2012).

eam bunch crossing (106 ns) for the INTT, which

References 1) An Upgrade Concept from the PHENIX Collaboration, arXiv:1207.6378v2 (2012). 2) Technical Design Report of SPHENIX (2019), (('-zico bm] grov/event/7081/. Technical Design Report of sPHENIX (2019), https://indico.bnl.gov/event/7081/.
 K. Adcox et al., Nucl. Instrum. Methods Phys. Res. A 499, 469 (2003).
 Nikkei Science, June (2023).
 B. Aubert et al., Nucl. Instrum. Methods Phys. Res. A 479, 1 (2002).
 M. Anderson et al., Nucl. Instrum. Methods Phys. Res. A 499, 659 (2003); C. Contin et al., arXiv:1710.02176 [physics:ms-det] (2018).

S1

2023 年度の理研 APR が発行されました。 グラビア:sPHENIX 今年のハイライト:後藤、Minho、糠塚 sPHENIX のレポート

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HOLLLOUTO OF THE VEAD

T. HIGHLIGHTS OF THE YEAR	
Measurement of direct-photon cross section and d	to uble-helicity asymmetry at $\sqrt{s} = 51$
GeV in "p="pcollisions =	
Y. Goto et al.	
Measuring single-spin asymmetry for forward neut	ron production in wide or range of
polarized $\rho + \rho$ collisions at $\sqrt{s} = 510$ GeV \Box	
M. H. Kim <i>et al.</i>	
Commissioning of the intermediate silicon tracker	in sPHENIX 🖸
G. Nukazuka <i>et al.</i>	
L. HICHERGETS OF THE YEAR	REEN Annual Error, Euro 52 (2021)
Complete les et the interned	internet in a DUENIX
Commissioning of the intermedi	ate alleon tracker in sPHENIX
G. Nukazuka ^{*1} Y. Akiba ^{*1} J. Bertarx, ^{*2} D. Cacac M. Fajiwara ^{*6} T. Eachiya ^{*1,e6} S. Hasegrava ^{*1,e7} M. H.	x, ⁴⁴ B. G. Cerato, ⁴⁴ A. Enskizono, ⁴³ K. Fujiki, ^{41,41} ita, ⁴⁶ B. Hoog ⁴⁸ J. Having ⁴⁸ M. Bernote, ⁴⁴ R. Kin, ⁴⁶
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The sPEENIX collaboration ¹) studies Quark-Quan Plasma and Cold-QCD at the Felaticistic Feavy Ian	X [
Collider (EHIC) at Brookhaven National Laboratory. There are four traders in the a ^N IENIX detector:	Social SPHEND/ Preliminary Au+Au (Spat) = 200 GeV
a MAP3-based Vertex Detector (NVTX), Internecti- ata Silcon Tracion (INTT), Time Projection Chamber	A PartofINTT used
(IPC), and TPC Outer Tracker (IPOT).	H 200
strip sensors, covering full azimuch angles and pseudo-	- up
56 indees equipped with efficient sensors with a sensi-	2 ² 100
are $78 \ \mu n \approx 520 \ \mu n \approx 10 \ mm or 20 \ mm m here, and amodel 100 \ mm m^2$	
super PPEX cmp ² result is scaps, the iNTE is be cated between the MVTX and IPC, and is responsible	72 74 76 71 60
The distector was installed in March 2023, and the con-	Felix Beam Cock Counter Delay (BCLK)
struction of the scalar structure was completed in April 2021. The commissioning started in May and	Fig. 1. Number of kits on the INTT harrel as a function of
was conducted with As Au collisions with center of mass mergy $\sqrt{s} = 200 \text{ GeV}$ triggered by a Minimum	a only parameter in the system.
Bias Detector (MBD) located at the forward leges. In order to measure particles in the collisions, the timing	BOOD BOOD BOOD BOOD BOOD BOOD BOOD BOOD
c) the signal readout must be appropriately adjusted. Figure 1 shows the number of hits per event measured	Au+Au (S., = 200 GeV
in the 1/15 region of the INTT harvel as a function of one of the delay parameters for the readoct timing.	
The peak at the center of the plot indicates that the timing of the Au-Au collision has been matched, while	
the region outside the peak is considered the back- ground, such as detector noise.	
Figure 2 shows a positive correlation between the number of hit clusters per event for the inner (x-axis)	10
and the outer (y-axis) harrels. The correlation can be explained by a simple picture: particles originst-	
ing from the collision inside the INTT barrels pass through the outer barrel if they pass the inner bar-	2000 4000 H000
⁴ BECEN Nishing Deuter Demostrative of Physics and Astronomy Deuter Informatic	Fig. 2. Correlation between the number of hit clusters in
⁴⁰ Physics Department, Broakhaven National Laboratory ⁴¹ Instrumentation Division, Brookhaven Sational Laboratory	the INTT inner barrel and the other barrel.
¹⁰ Department of Physics, Bikkyo University ¹⁰ Department of Mathematical and Physical Sciences, Nara Weight, University	 sel. Validation of such a simple concept is evidence of the healthy sparation of the detector. Other correla-
⁴ Advanced Science Research Center, Japan Atomic Energy Agong	tions, such as the number of hits of INTT and other detectors, and the collision points reconstructed in the
 Department of Physics, Korea Travenity Indernation Systems Technology Division, Todays Metropolicies, American Science, S	learn axis by INTT and by MDD, also showed row somble results, i.e., INTT behaved as experied. The
⁴¹⁰ Dena-tmeni of Physics, National Central University ⁴¹³ Departmeni of Physics, National Taiwaa University	- chip-by-chip analysis of FPHX also confirmed that ap- proximately 39% of the chips were in good condition.
001:10.34448/11X0N.APR.57-030	

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<u>t√s = 510</u>

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ENIX





is evidence of Other correla-TT and other structed in the o showed rear expected. The irnel that ap-