1. property とは?

例えば Binding Energy の 核子数依存性などです。

It's mass number dependence of the binding Energy for example.

→ 他は?

例えば 密度変化 です。

It's changing of density.

→ それを調べるモチベーションは? 高密度方向で

Strangeness physics として、Lambda や Sigma など。

ハイペロンの~~方面~~について は さまざまに 調べられていますが、

核子多体系に K中間子を入れた物理は今までに K^-pp しか

証拠がつかめていません。 Kaonが高密度下でどうふるまうか知りたい

むしろ K中間子方面を 整備しない方が ありえません。

As strangeness physics or high density physics,

Hyperon & Hyper nuclear were searched a lot so far.

On the other hand, about Kaon, only "~~K̄d~~" and "K^-pp"

were confirmed. We want to know how Kaon behave in High dense matter.

~~It cannot~~ There is no reason why we don't need Kaonic nuclei.

---

2. No pauli exclusion principle & $\bar{K}N$ が強いことの重要性は?

Although ΛN is also no pauli exclusion principle,

$\bar{K}$ is a meson, and $\bar{K}N$ is very strong.

SO $\bar{K}$ is more impurity than Λ for nucleon.

It ~~is easier~~ should be easier for N to feel $\bar{K}$, than Λ

So we can get more clean signal that don't realize in normal nuclear system

3. BE と 密度は 1対1 対応するんですか.

No, that is why I write "suggest" here.
But we can predict that,
because ~~BE is big~~ spreadness of wave function becomes small if the system has deep potential.
~~BE~~ Deep potential should be expected from big BE.

(deuteron の 核子間きょり ~ 2.4 fm
通常核の 核子間きょり ~ 1.8 fm
核子密度 ~~[illegible]~~ 1.4/fm³)

---

4. なぜ Λpn mode を測る必要があるの?

束縛状態を確めるだけなら Λd だけではないか?
その内部構造にせまろうとすると、Λpn や 他のメソニック mode の測定も必要.
私たちは束縛状態の発見だけで満足していない.

If we want to confirm ~~binding~~ bound state of Kaonic ~~nuclei~~ nuclei, ~~as you say~~ you are right.
But we want to approach its ~~a~~ internal structure.
So, ~~mesu~~ measurement ~~a~~ about Λpn or ~~other~~ mesonic decaymode.

---

5. どのくらい ~~Larger~~, Better になるの?

About 1.7 times Larger acceptance (from 59% to 93%)

and About 4 better capability (from 3% → 12%)
~~3% → 12%~~ 4 times

6. Time Resolusion のグラフの見方.

The horizontal axis ~~is~~ Injected position of beam, positron.

vertical axis is Time Resolution with pico sec unit.

This figure shows. that there is not clear position dependence of time resolution

The average time resolution is about 115 ps.

→ この実験で一番がんばったこと.

~~Two years~~ It was difficult for me to make jigs to avoid ~~to disconnect~~ disconnecting between scintilator and light guide because the light guide ~~is~~ was kind of long.

I made them by using 3D printer.

I started ~~its blue print~~ from thinking its design.

→ この実験でわかったことは?

~~The detector safficients~~

The time resolution is ok if used to PID, but not good enough to analize Momentum of neutron.

And It is better that we use short light guide or no light guide

→ ~~それ~~は改良されたの?

Yes. ~~Now~~ ~~CNC~~ ~~[illegible]~~ we removed light guide from CNC. & we apply MPPC instead of PMT.

During E73, my seniour researcher has analized it in that case, ~~by using~~ at J-parc.

The result is about 80 ps

It is good enough.

→ How good enough?

The resolution from TOF ~~should be~~ becomes smaller than resolution from width

7. E73とE80のつながりは?

In E73, we took the data of 4He terget ~~for~~ as ~~control run~~ calibration run.

~~Namely~~, and E73 was conducted at ~~the~~ same beam line and similar Detectors as E80.

Namely, I just join it to ~~learn~~ experience and practice for E80.

→ 具体的にどんな貢献をしたの?

I mainly checked Beam line wire chamber and old CDC ~~[illegible]~~ ~~run~~ ~~day~~ [illegible] every time, for example their noise level and gain and Hit pattern etc.

And about Beam line chamber,

I determined the appropreate HV value and Threshold Value.

→ 何を学んだか。

It is difficult to ~~use~~ use wire chamber,

And Accelarator often stopped [illegible].

I learned that.

→ 外国人とどのようにかかわったか!

I made the shift manual to ~~[illegible]~~ work easily

And I go to talk them actively when changing shift time for example!

Because the majority is Japanese, I want them to relax.

8. Gas study を old でやって問題ないの?

Yes. Because the structure is ~~couple~~ perfectly same, except for its length.

→ $ArCO_2$ の割合 それぞれ最適? あれのなかにチョイスしたの?

Ar is 90 %. CO_2 is 10 %. My sineon member decided it.
I don't know now, I have to study ~~所~~ by JPS meeting.
~~Thank you for the question.~~

→ このグラフの見方

Horizontal axis is HV value,
vertical axis is Efficiency,
Here Efficiency is definited as
~~these~~ the ratio of the number of event ~~of~~ that multiplicity is bigger than 1, in cosmic ray events.

I get ~~the~~ a information that we shold choose around 2400 V from this result.
~~But we haven't have no idea in detail yet.~~ About more detail, I ~~will~~ restart to ~~attempt~~ analyze it from today.

→ test 1 と 2 のちがい

~~I will~~ The number of ~~wires used~~ used wires.
This year, I can only a few read out circuit because E73 is postphoned. This is test 1.
After E73 is ~~will be~~ finished, I will use all wires as test 2.

9. DAΦNEで何を測りたい？解決したい？頑張したい？

I want to solve kaon mass puzzle,

that there is a gap between different way to measure.
(~60 keV)

My research thema is kaonic nuclei,

as a user of kaon,

I feel so bad to this uncerteinty of kaon mass.

because kaon mass is related to all kaon physics.

That's why I want to go DAΦNE.

→ もう向こうの人にコンタクトとってるの？

Not yet, but, when some researcher who played the ~~experiment~~ I want to do ~~came~~ ELPH, we know each other.

I ~~go~~ ~~went to eat dinner with them.~~

~~At that time, I tell them I want to go Italy~~

in 2025. They told me we look forward to come Italy.

so I can contact them anytime.

10. $\bar{K}pp$ を確定させるだけ？

~~No~~. No, of course main purpose is that.

but. we derive how ~~compact~~ ~~kaonic~~ $\bar{K}pp$ is compact from Λpn mode. but this is difficult & complex.

I'm studying that, Sorry I can not say detail.

Also I need to ~~corporate~~ discuss it with theorist

11. ~~Ete~~ K^-ppn の Signal では見えなかったろう?

That is interesting in an unexpected way.

~~#~~ I want to explain a reason why K^-pp is bound ~~by~~ but K^-ppn is unbound.

Effect of K^-n ($\bar{K}N$ with $I=1$) ~~large~~ intraction is bigger than we ~~the~~ expect.

That is interesting. Thank you for the question

---

12. E80では終わったら何がしたい。

~~I want to~~

Of course, we plan next kaonic nuclei "K^-ppnn",

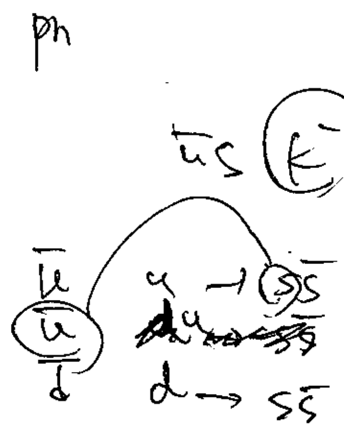
But I want to measure the "$\bar{K}\bar{K}NN$", ~~double multi Kaon system~~ double kaonic ~~He~~ nuclei.

→可能なの?

I have no idea whether or not It's possible.

But we can anti proton beam.

So we can measure ~~$\bar{p}$ 3He~~, $\bar{p}$ & 3He annihilation. ~~He~~ It is worthful to consider.



~~pn~~

pp

13. 小学生に伝えるなら？

There is super high dense matter in the universe, called neutron stars
Please image 10 t namely 10 thousant kg in one cubic centimeter
Unfortunately there is no such matter on the earth,
and we ~~cannot make~~ have never made such matter.
But, in our experiment, It might be made.
If really so, that is big discovery, and maybe we can know inside of such a high dense matter

14. 将来は研究者になりたい？

I want to be a researcher who have
a lot of wisdom and knowledge about from
elementary particle to cosmic physics.
And
I want to coorprate with researchers
in the world, to contribute to deep understanding
about this universe.

15. 留学は海外経験は？

No, but I actively participated in
International school and did experiment with
KEK in Japan.
foreigners in EM3.
I ~~try~~ tried to utilize such chance as possible as I can.
tried and will try