



Thanks Letter to Ando Lab

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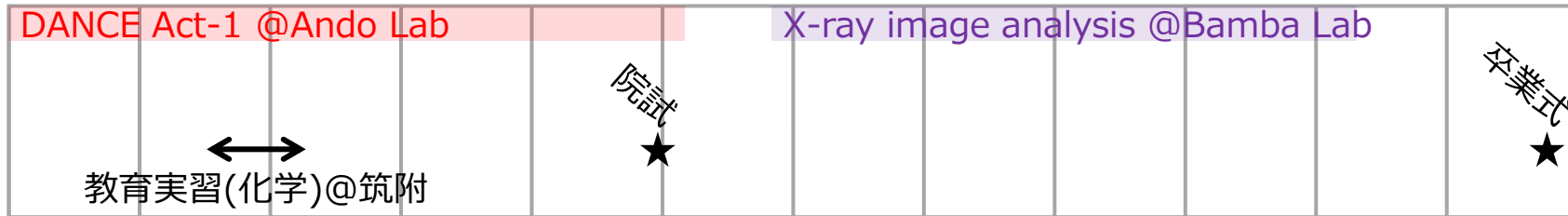
- You know what I did very well
- I focus on what I thought at that time and what I am thinking now
- Sorry for the random topics

My 5.5-year history in Ando Lab

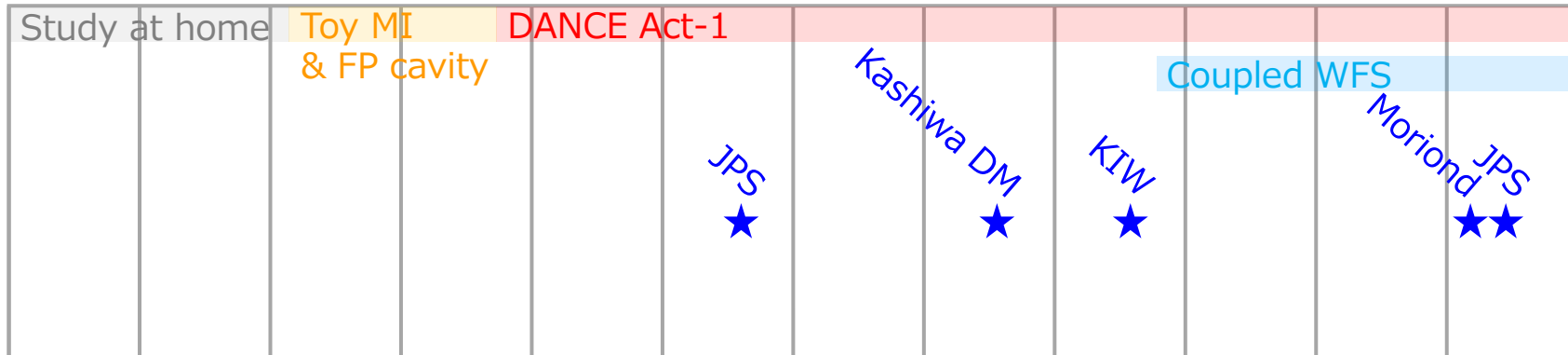
- : Seminar
- ★ : Big event
- ★ : Conference

Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar

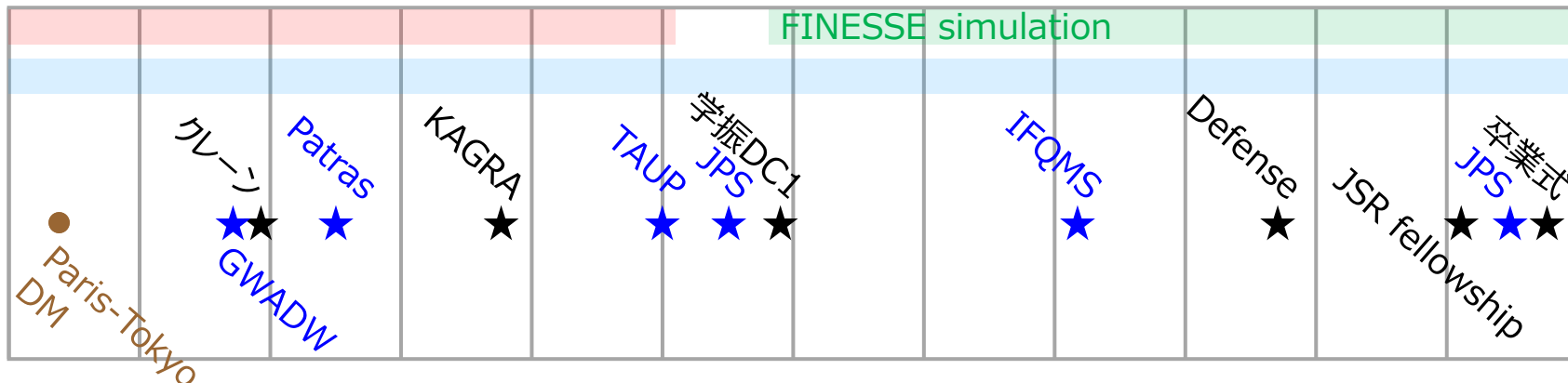
B4
(FY2019)



M1
(FY2020)

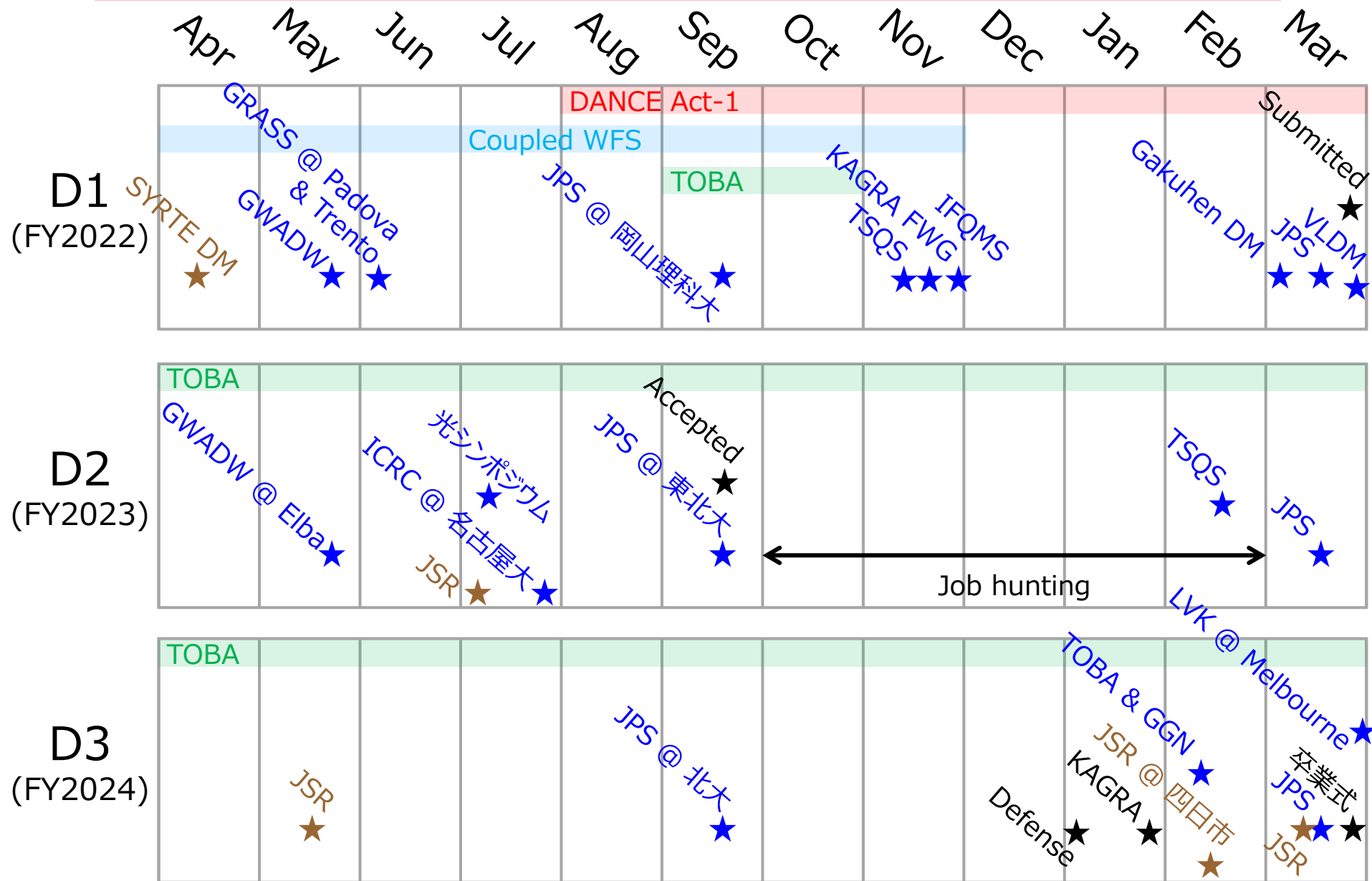


M2
(FY2021)



My 5.5-year history in Ando Lab

- : Seminar
- ★ : Big event
- ★ : Conference



Thoughts in B3 (1)

- I wanted to study astrophysics since high school
- A8 instead of A5
- I visited Yoshida Lab first because Moriwaki-san is there
- ICRR Spring School at the end of B3
 - Ouchi-sensei invited me to join
 - Ushiba-san, Yuzurihara-san, and Tagoshi-sensei taught us experiments and data analysis in GW group. (I said “nice to meet you” to Ushiba-san at KAGRA in M2…)
 - Tagoshi-sensei told me I am suited for KAGRA. (He talked about this in my master's and Ph.D. thesis defenses)
 - I love Hongo Campus. I don't want to go to Kashiwa because it is a sad place. Lalaport and nothing

[Presentation slides](#)

Thoughts in B3 (2)

- Yamamoto Lab
 - Yamamoto-sensei and Ohya-san are good
 - We had to move to Bamba Lab in Ph.D. course
 - Experimental setups were almost gone
- Bamba Lab
 - I really admire and like Bamba-sensei
 - Experiment in master / data analysis in Ph.D.
- Ando Lab
 - I fell in love at first sight with the exp. room of Ando Lab
 - Ando-sensei seemed calm, and seniors (Shimoda-san, Takano-san, Kita-san) seemed kind and happy
 - I wanted to enroll in for 特別実験. (I won the lottery against Fujimoto-kun)
- Kusaka Lab
 - A lab with long history is better for me
 - If I were B4 now, I'd want to get in

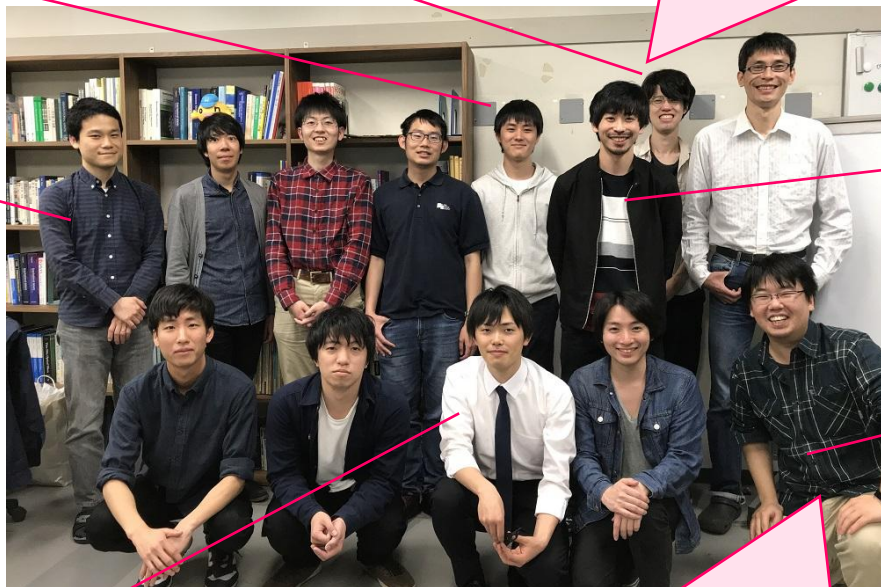
Experiences in 特別実験

Finesse and aliasing

Soldering and alignment

Professors don't come to the lab, but students teach each other

Basics and strategy



Calculation of RMS

Mode-matching

PDH method

Professors don't tell us to do this, so we should be active

Michimura-san and Nagano-san

“the person who did the experiment is the most admirable”

Good points of Ando Lab

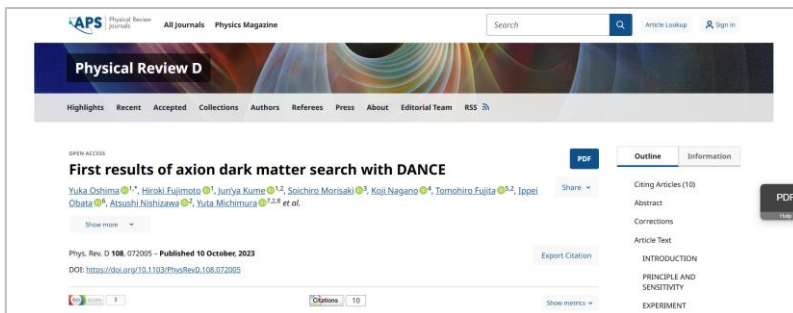
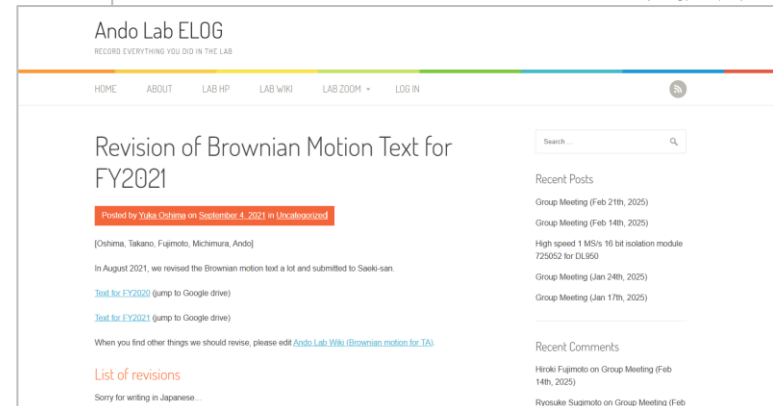
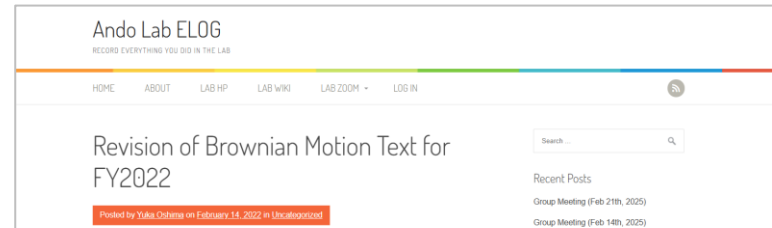
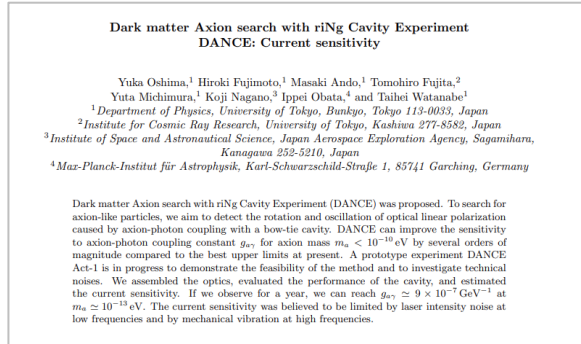
- Presentation practice for JPS and thesis defense
 - Takano-san and Ching Pin-san
“the practice session is the real performance”
 - Your comments are critical, but your expressions are very kind. I appreciate it very much
- Journal club in Japanese
 - 4 times in M1, 3 times each in M2 and D1
 - cf.) Seminar: 2 times each in M1-D1, once in D2
- Many visitors from all over the world
- Japanese GW community is made from Ando Lab

Thoughts choosing my research topic

- 特別実験: DANCE
 - I want to study astrophysics (only DANCE?)
 - Fujita-san said to me “our rival is MIT (ADBC)”
- Master’s course: Coupled WFS for TOBA
 - TOBA is filled with various elements and main topic in Ando Lab
 - No one to succeed Takano-san → Waste of setups
 - Something less difficult than torsion pendulum
- Ph.D. course: TOBA
 - Try to work on TOBA's mainstream (= torsion pendulum)
 - It is also Ando-sensei's hope

My good points

- Many conferences in my master's
- Writing proceedings in my master's. English corrections by Ching Pin-san were instructive
- DANCE experiment with Fujimoto-kun in M1 (Kawasaki-san said "you seem fun")
- Brown text revision with Fujimoto-kun and Takano-san in M2
- My first paper about DANCE submitted in D1



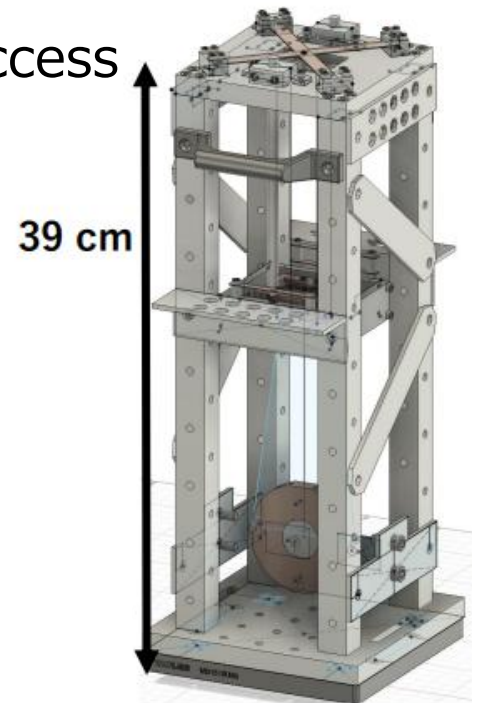
My reflections

- I should have started torsion pendulum from my master's
- I was lazy in D1
- Result of my Ph.D. thesis is insufficient
- TOBA becoming a project \leftrightarrow Doing research freely
- Concentrating on design, calculations \leftrightarrow Taking actions, experiments
- Ono-kun's suspension meeting was a success

結果のまとめ 44 / 47

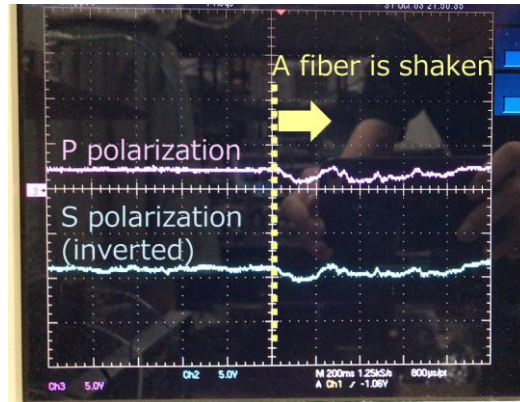
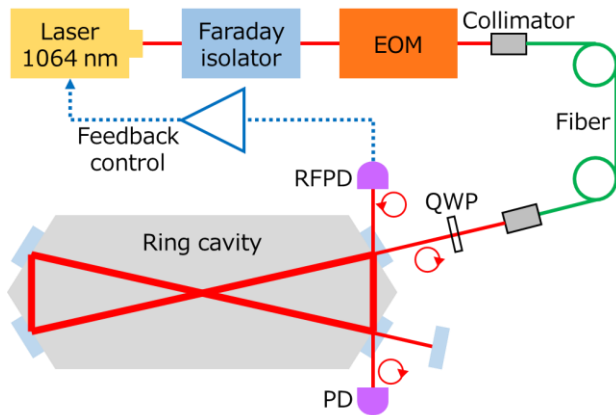
		本研究の結果	本研究の設計値	Phase-III TOBA 設計値
光学系	光てこ	回転検出	補助センサ	補助センサ
	差動 ファブリペロー 共振器	フィネス ~ 300 TOBA初の導入 アンロック	フィネス 400 ロックして回転検出	フィネス 50 ロックして回転検出
懸架系	テストマス	アルミニウム製(シリコン仕様) TOBA初の設計		シリコン製
	ねじれ 共振周波数	117 mHz	28.7 mHz	7.7 mHz
	ねじれQ値	~ 50	10^3	10^8
	テストマス傾き	$\sim 2 \times 10^{-3}$ rad	10^{-4} rad	10^{-8} rad
	GASフィルタ 共振周波数	TOBA初の導入 3-4.5 Hz	3 Hz	3 Hz
冷却系	温度	300 K	300 K	4 K
感度 @ 0.1 Hz		3×10^{-7} / $\sqrt{\text{Hz}}$	3×10^{-11} / $\sqrt{\text{Hz}}$	4×10^{-15} / $\sqrt{\text{Hz}}$

博士論文審査会 2025/01/07 理学部1号館414号室



My happy moments in experiments

- Found a fiber was not good for polarization @ DANCE, B4
- Found non-simultaneous resonance @ DANCE, M1
- FINESSE simulation for liner range @ Coupled WFS, M2
- Auxiliary cavity flashed @ Coupled WFS, M2
- GAS filter worked well @ TOBA, D3 (relieved than happy)



P and S polarizations do not resonate simultaneously

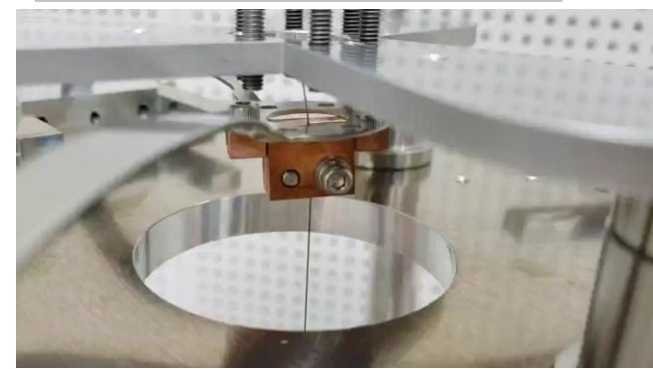
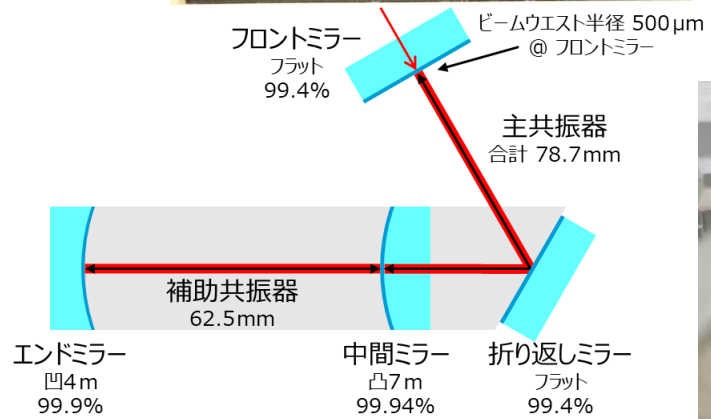
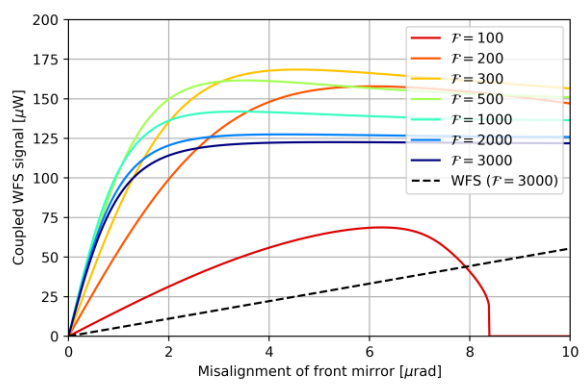
Posted by Yuka Oshima on January 28, 2021 in Aeon

[Oshima, Fujimoto]

I evaluated the performance of a cavity with S polarization ([=log #5353](#)).

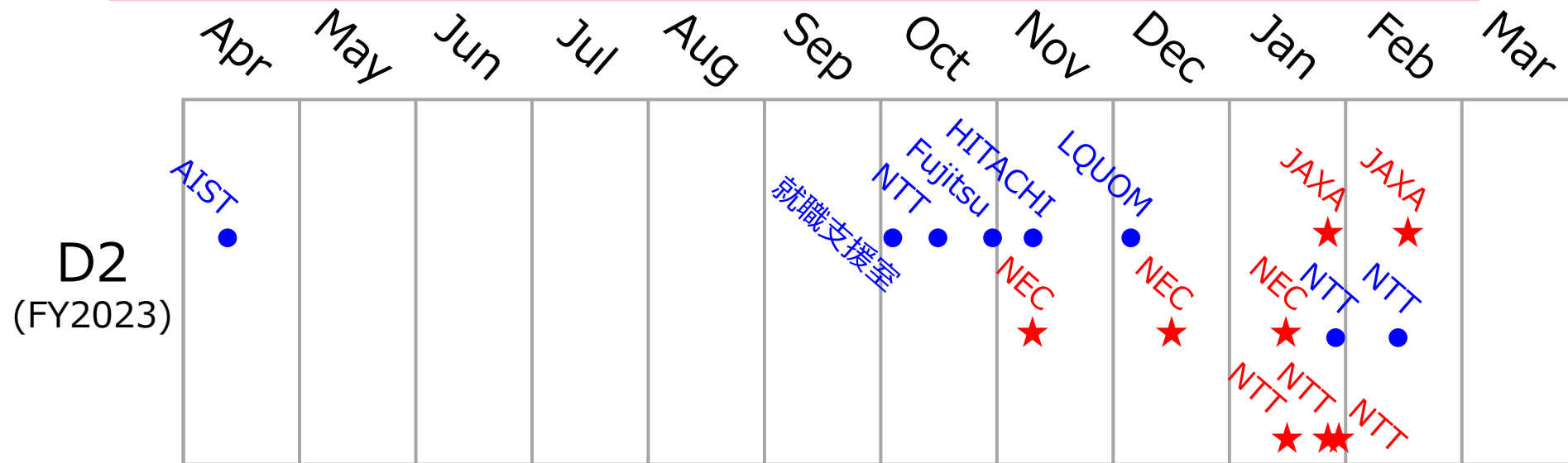
Next, we tried to measure finesse with P polarization. At that time, we noticed that P and S polarizations did not resonate simultaneously in a cavity for DANCE. We injected P and S polarization, modulated laser frequency, and obtained cavity scan. Resonant frequency of P and S polarization were actually different each other (Fig. 1).

Fig. 1: Cavity scan when P and S polarization were injected



My job hunting

★ : Interview ● : Meeting

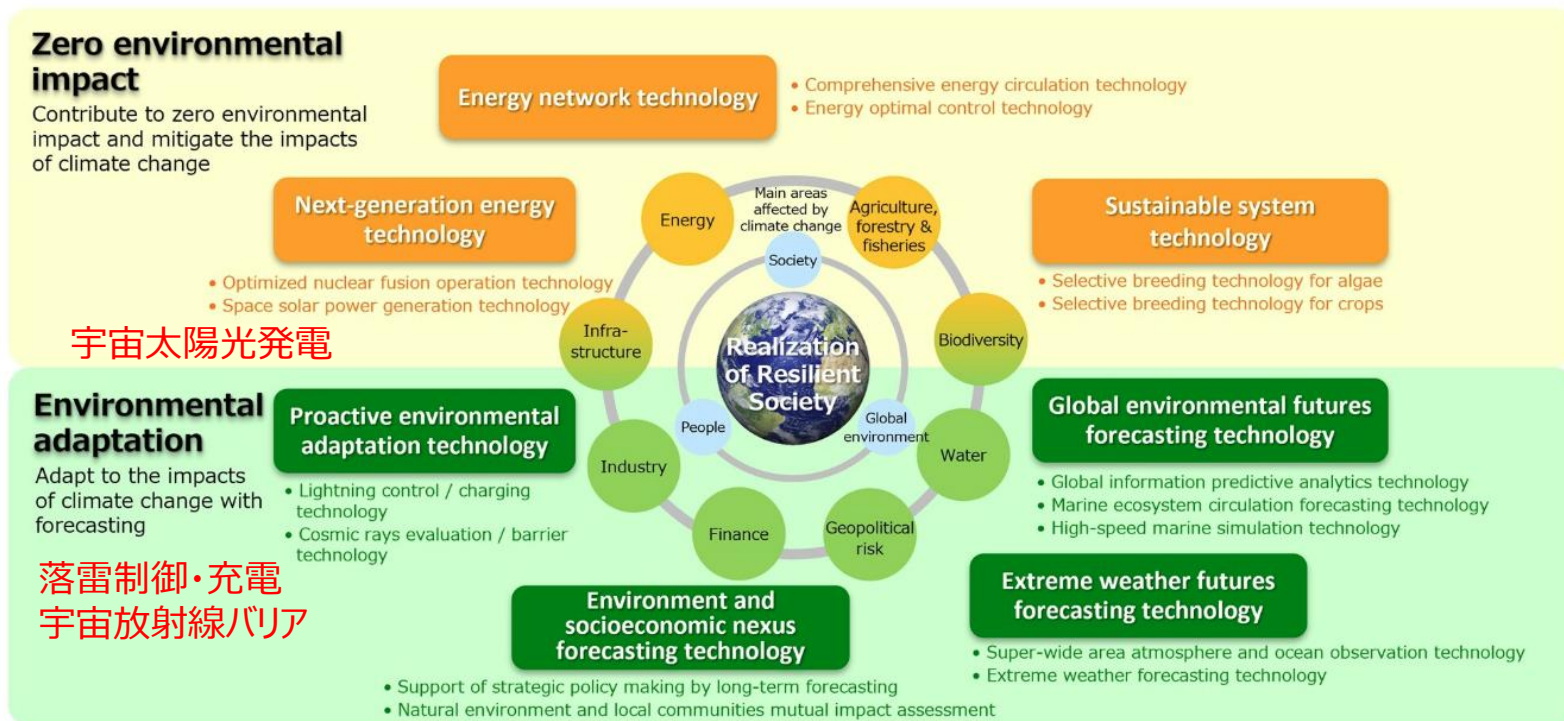


- 教職免許 in B1-B4
- 文科省・警察庁 internship @ B3
- 国家公務員試験 @ M1 → Not passed
- Not accepted for JAXA internship @ B3? and D1
→ Visited ISAS in February in M2, JAXA in September in D1
- I relied on my seniors and friends a lot
- Books I left: 国家公務員試験, web test, (crane training)

NTT SE Lab from April

- NTT Space Environment and Energy Laboratories (宇宙環境エネルギー研究所)

@ Musashino location (10 min. from Mitaka station by bus)

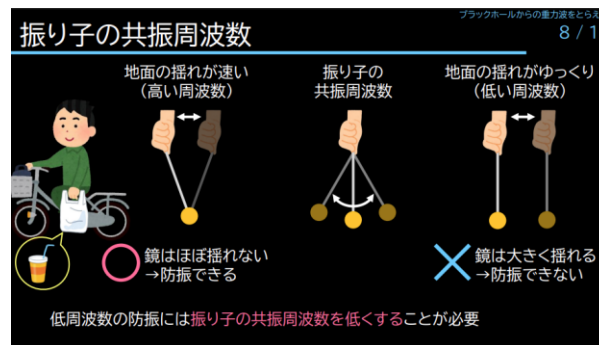


My outreach activities

- TA for Galaxy School (2017-2021)
- Staff for NAOJ Stargazing (2019-2025)
- TA at Senior High School, University of Tsukuba (2020-2022)
- 10分で伝えます！ 東大研究最前線
at Komaba Fes. (2022) and May Fes. (2023)
- Open Campus and many events for female students



- Good interaction with my research



I would like to see more women

- “Sometimes we understand our not-so-close female friends better than any of our male best friends”
 - Health
 - Life plan
 - ...
- Even when I was the only woman, everyone at Ando Lab treated me without regard to my gender. Ando Lab was a very comfortable place to me
- I was very happy when Mengdi-san and Yamaguchi-san joined us
- I hope Ando Lab will continue to be open to women

My cherished words

- Prof. Dumbledore to Harry

- Encouragement

“It is our choices, Harry, that show what we truly are, far more than our abilities.”

「ハリー、自分が本当に何者かを示すのは、持っている能力ではなく、自分がどのような選択をするかということなんじゃよ」

- Lessons

“Youth cannot know how age thinks and feels. But old men are guilty if they forget what it was to be young ... and I seem to have forgotten, lately ...”

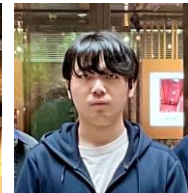
「若い者には、老いた者がどのように考え、感じるかはわからぬものじゃ。しかし、年老いた者が、若いということがなんであるかを忘れてしまうのは罪じゃ……そしてわしは、最近、忘れてしまったようじゃ……」



Conclusion

What I have received from Ando Lab members
» what I have given to them

If I had to take the graduate entrance exam
by time leap 5 years ago,
or if I were a new B4 student,
I would like to enroll in Ando Lab



Thank you!!