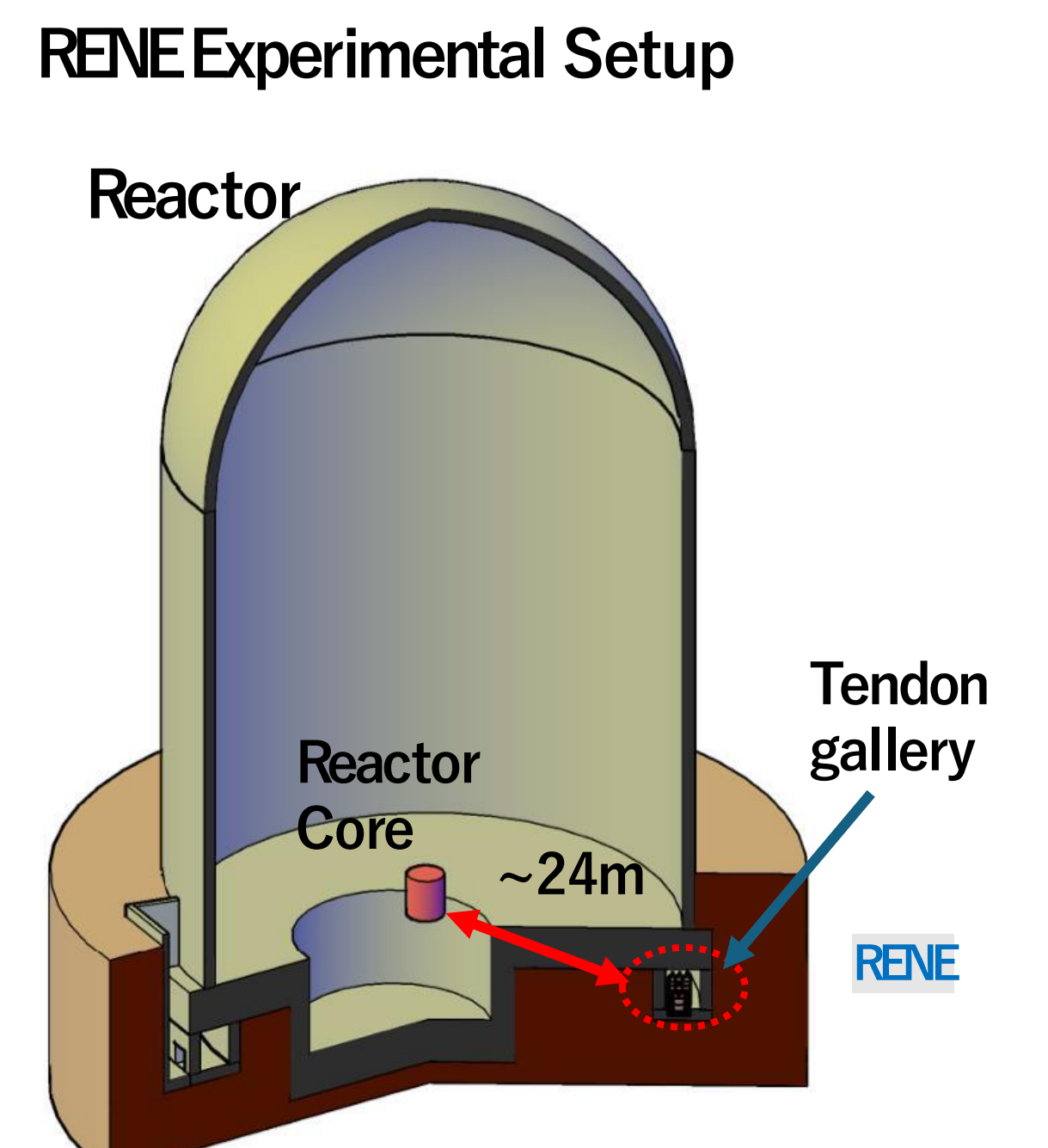
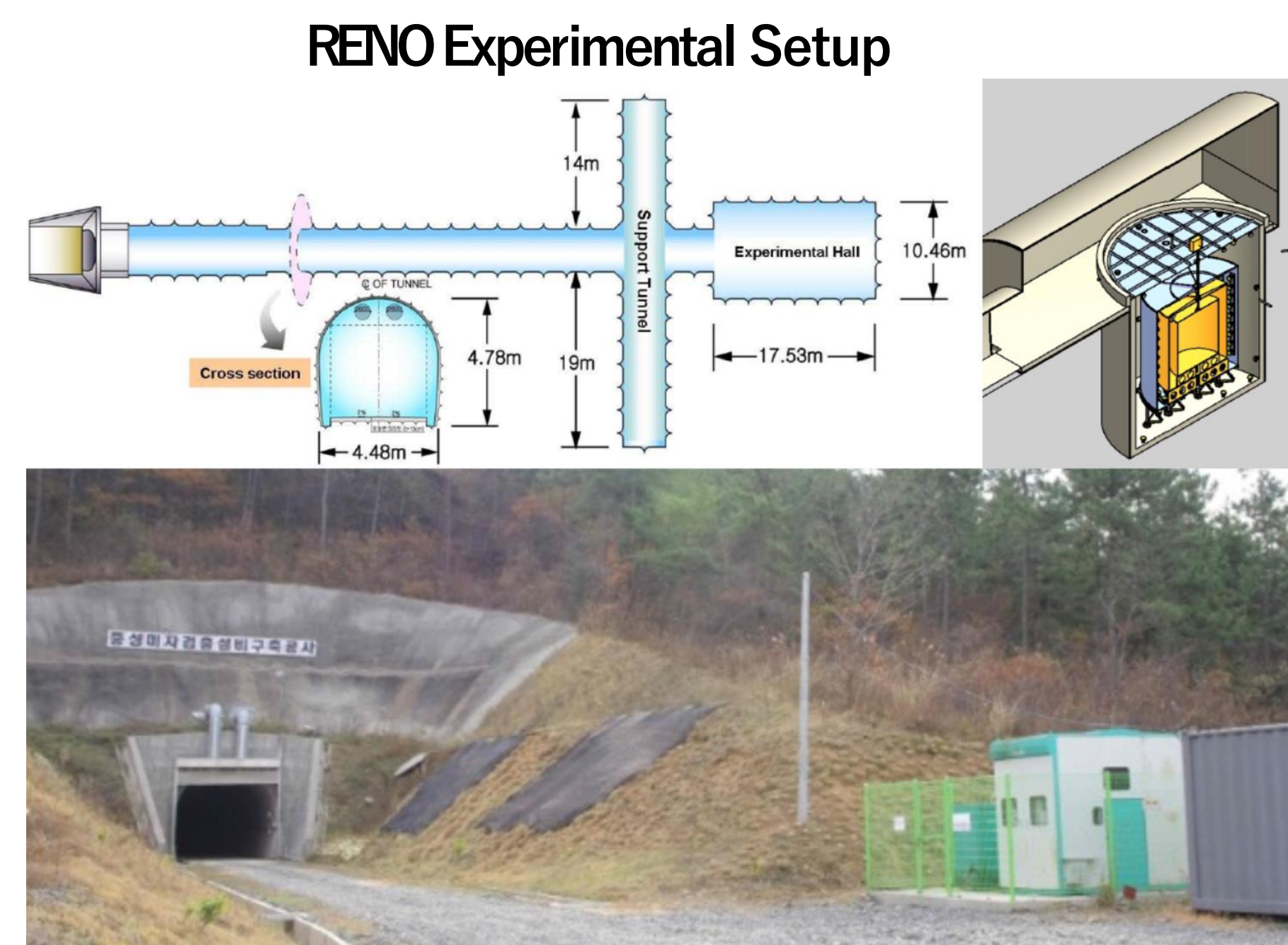
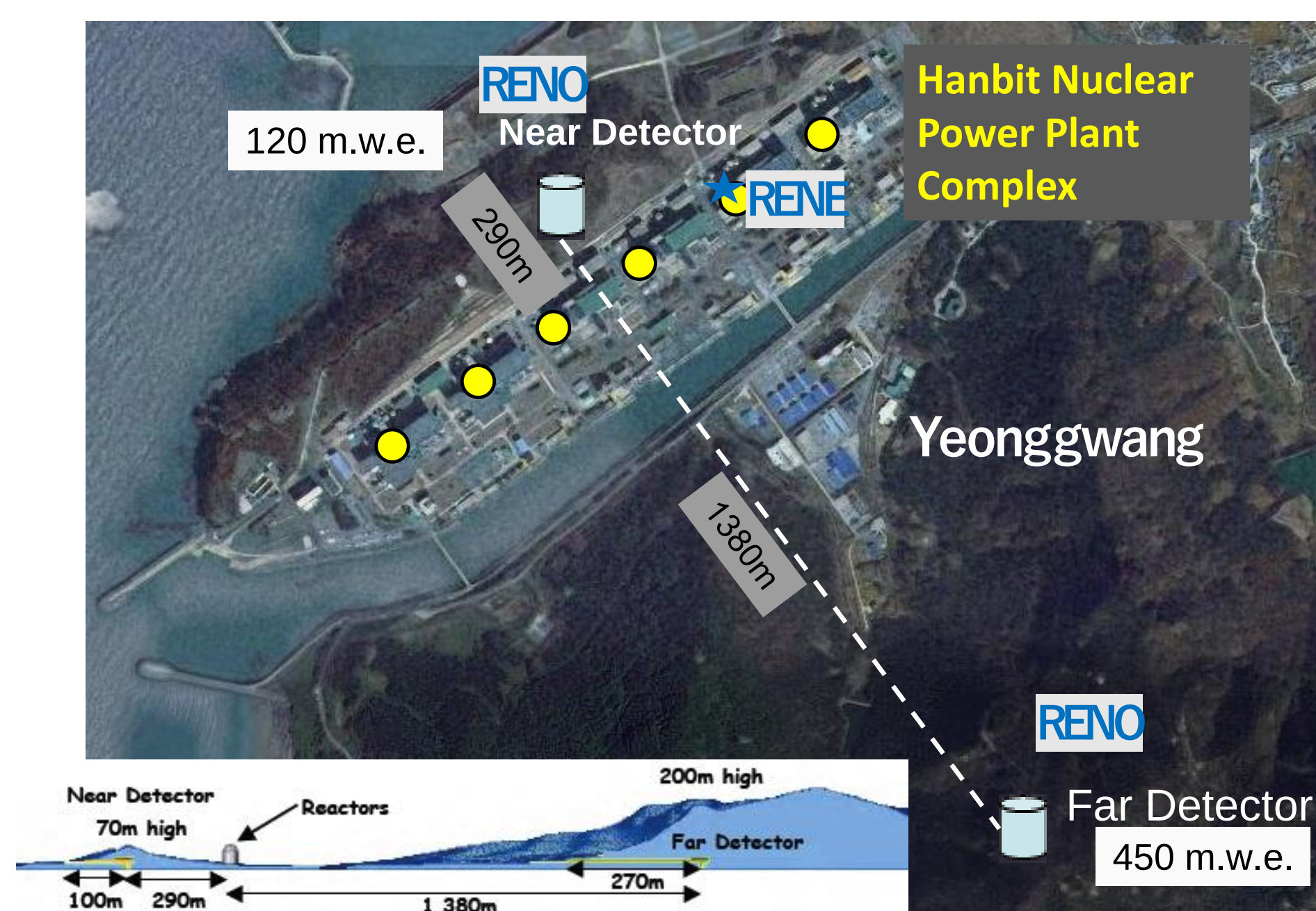
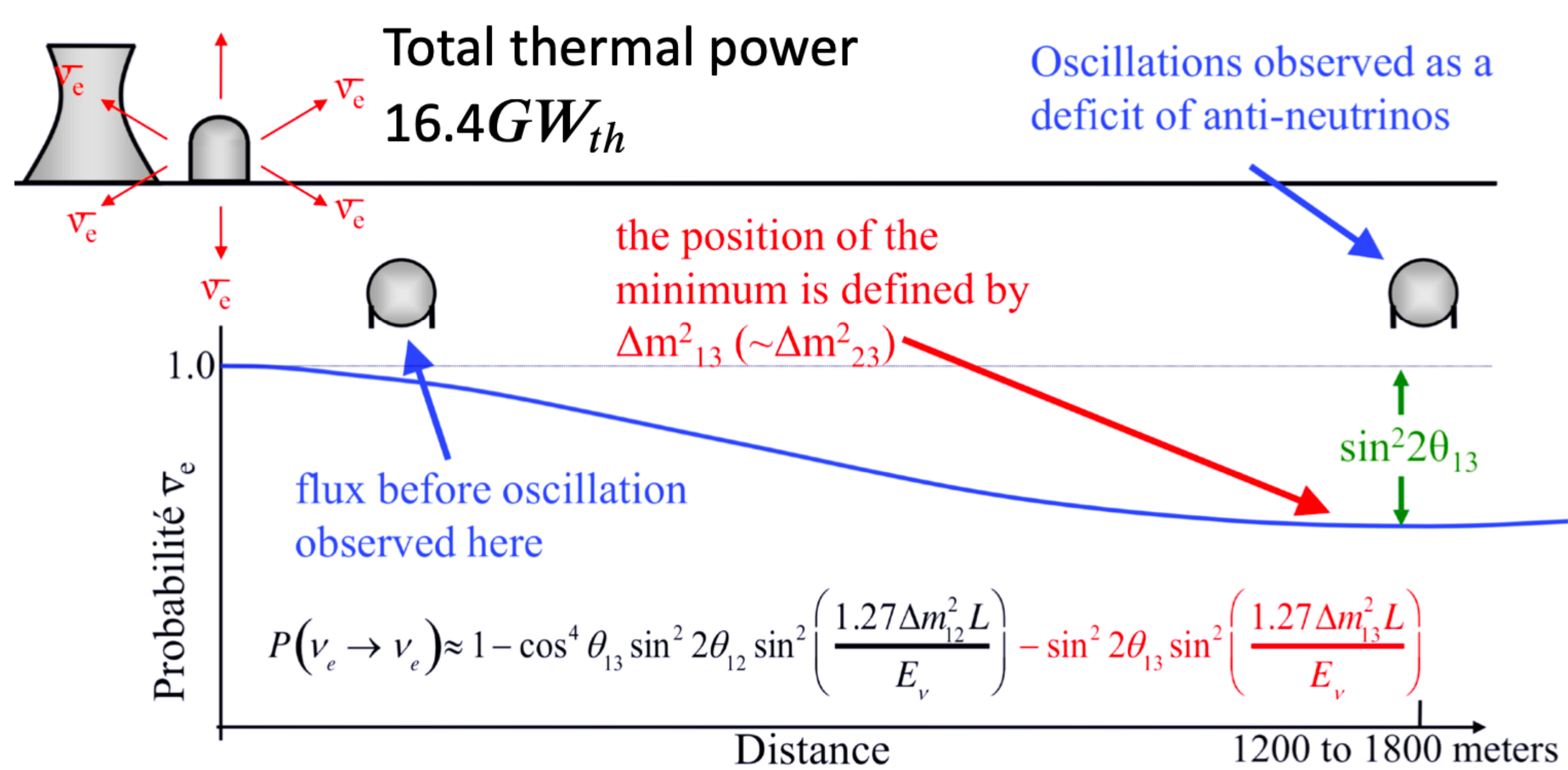


## Introduction



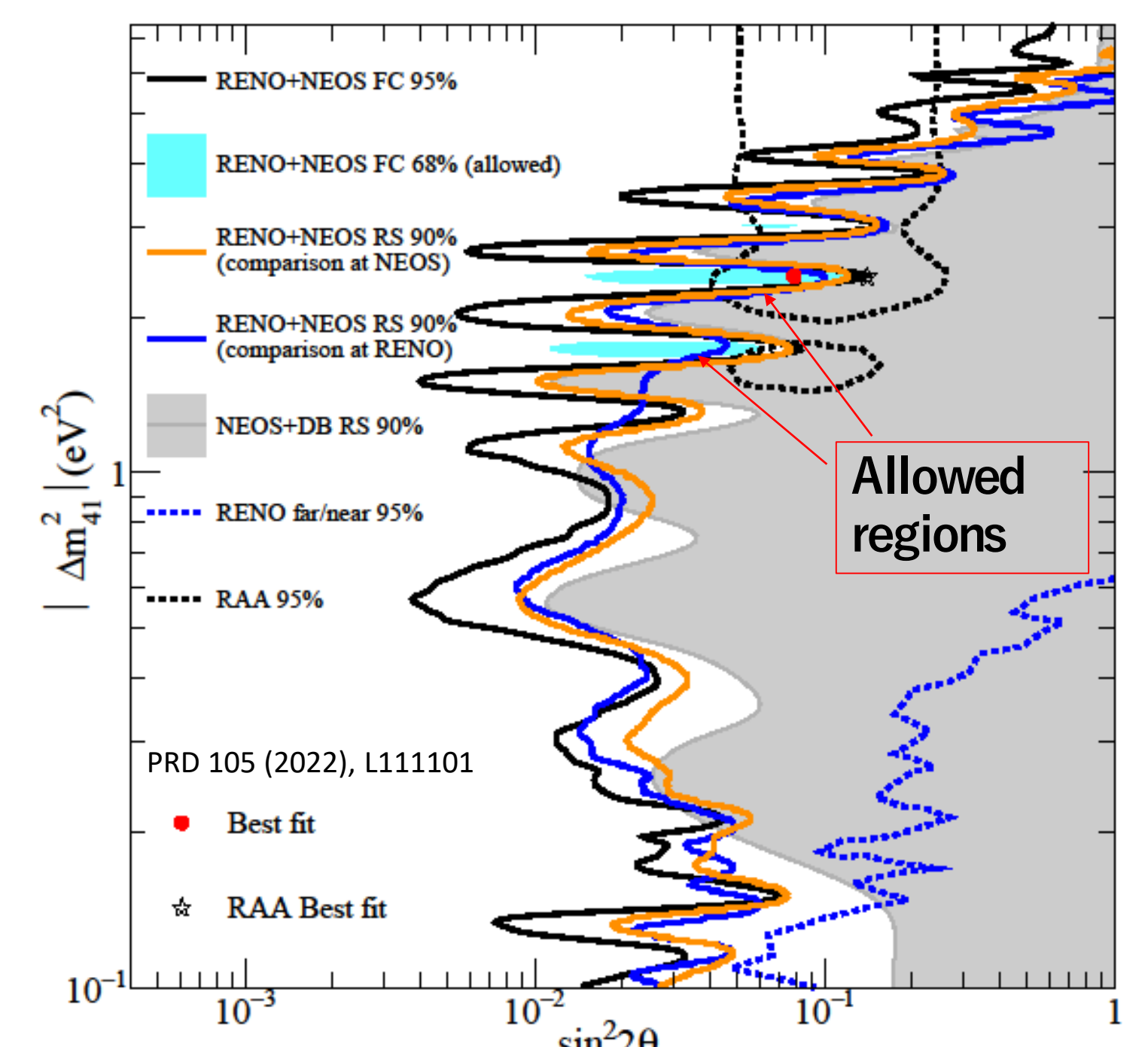
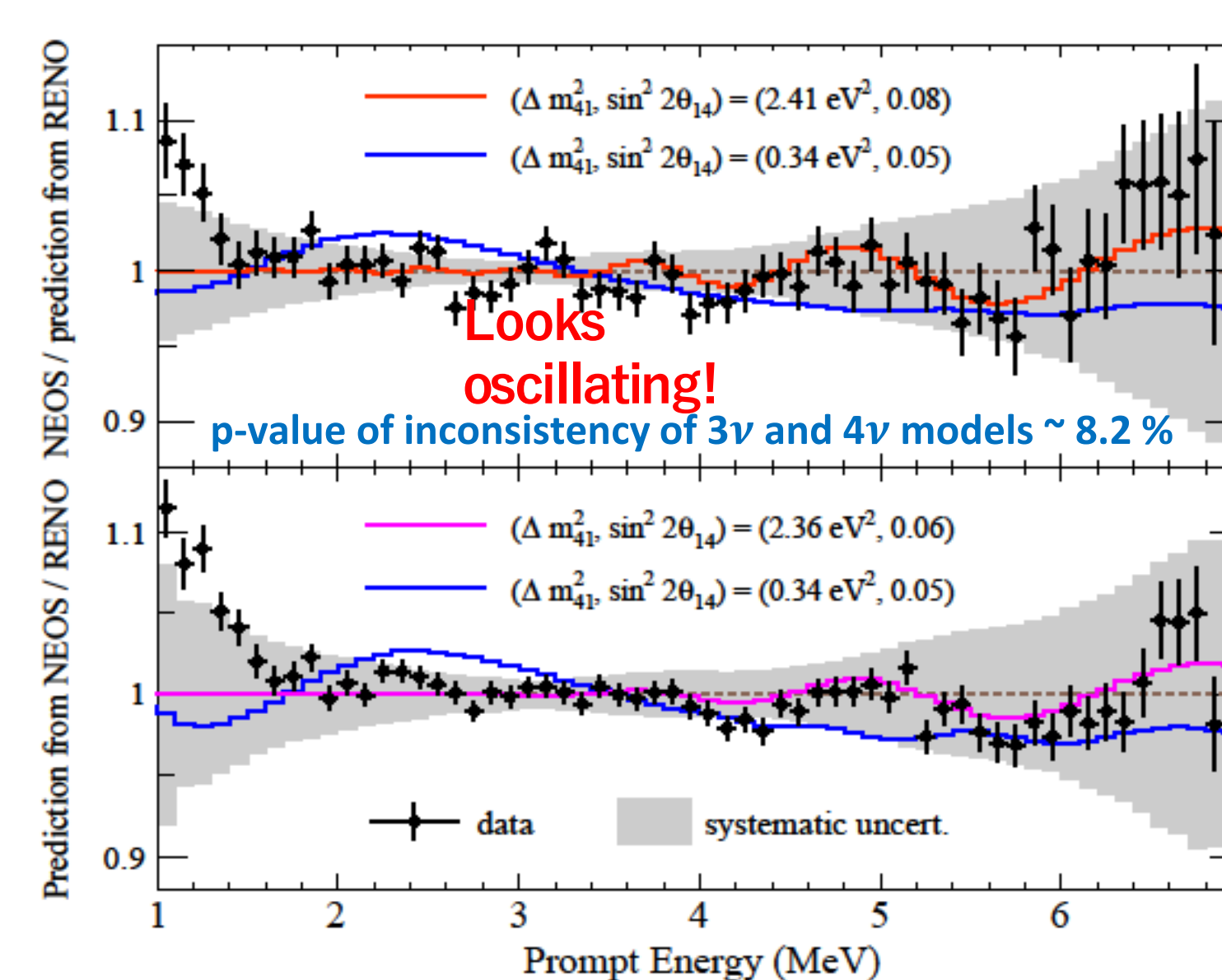
## Physics goal

### RENO Reactor Experiment for Neutrino Oscillation



### RENE Reactor Experiment for Neutrino and Exotics

RENO and NEOS joint analysis  
Hint for the sterile neutrino at  $\Delta m^2_{41} \sim 2 \text{ eV}^2$ .



To confirm the allowed regions, need to **improve energy resolution and systematics.**

## Collaboration

### 8 Institutes and 30 Physicists

Chonnam National University  
Dongshin University  
Gwangju Institute of Science and Technology  
Gyeongsang National University  
Kyungpook National University  
Seoul National University  
Seoyeong University  
Sungkyunkwan university

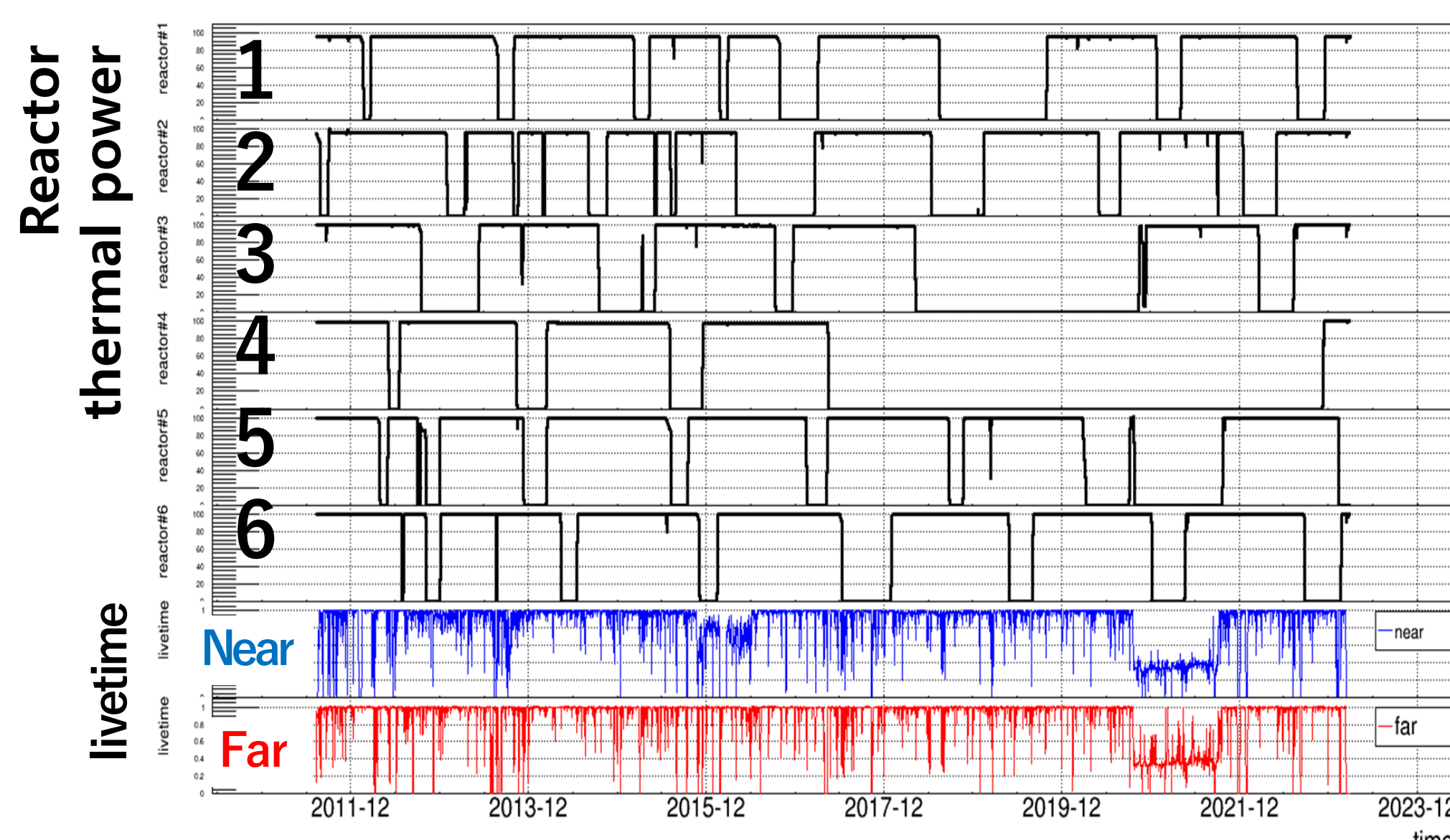


11 institutions & about 30 members

## Time Line

- Start of project: 2006
- RENO DAQ running Aug. 2011~ Mar. 2023  
3800 days livetime

- Recently, started re-operating DAQ of the near detector.  
→ RENE experiment



| Year                              | 2022              | 2023              | 2024              | 2025              |
|-----------------------------------|-------------------|-------------------|-------------------|-------------------|
| Month                             | 1-3 4-6 7-9 10-12 | 1-3 4-6 7-9 10-12 | 1-3 4-6 7-9 10-12 | 1-3 4-6 7-9 10-12 |
| Collaboration Start               |                   |                   |                   |                   |
| Design                            |                   |                   |                   |                   |
| Simulation                        |                   |                   |                   |                   |
| Gd-LS and LS                      |                   |                   |                   |                   |
| DAQ                               |                   |                   |                   |                   |
| PMT                               |                   |                   |                   |                   |
| Construction                      |                   |                   |                   |                   |
| Commissioning (RENO far site/CNU) |                   |                   |                   |                   |
| RENE Data taking (Tendon gallery) |                   |                   |                   |                   |

## Physics results of RENO

### Precise measurement of $|\Delta m^2_{ee}|$ and $\theta_{13}$

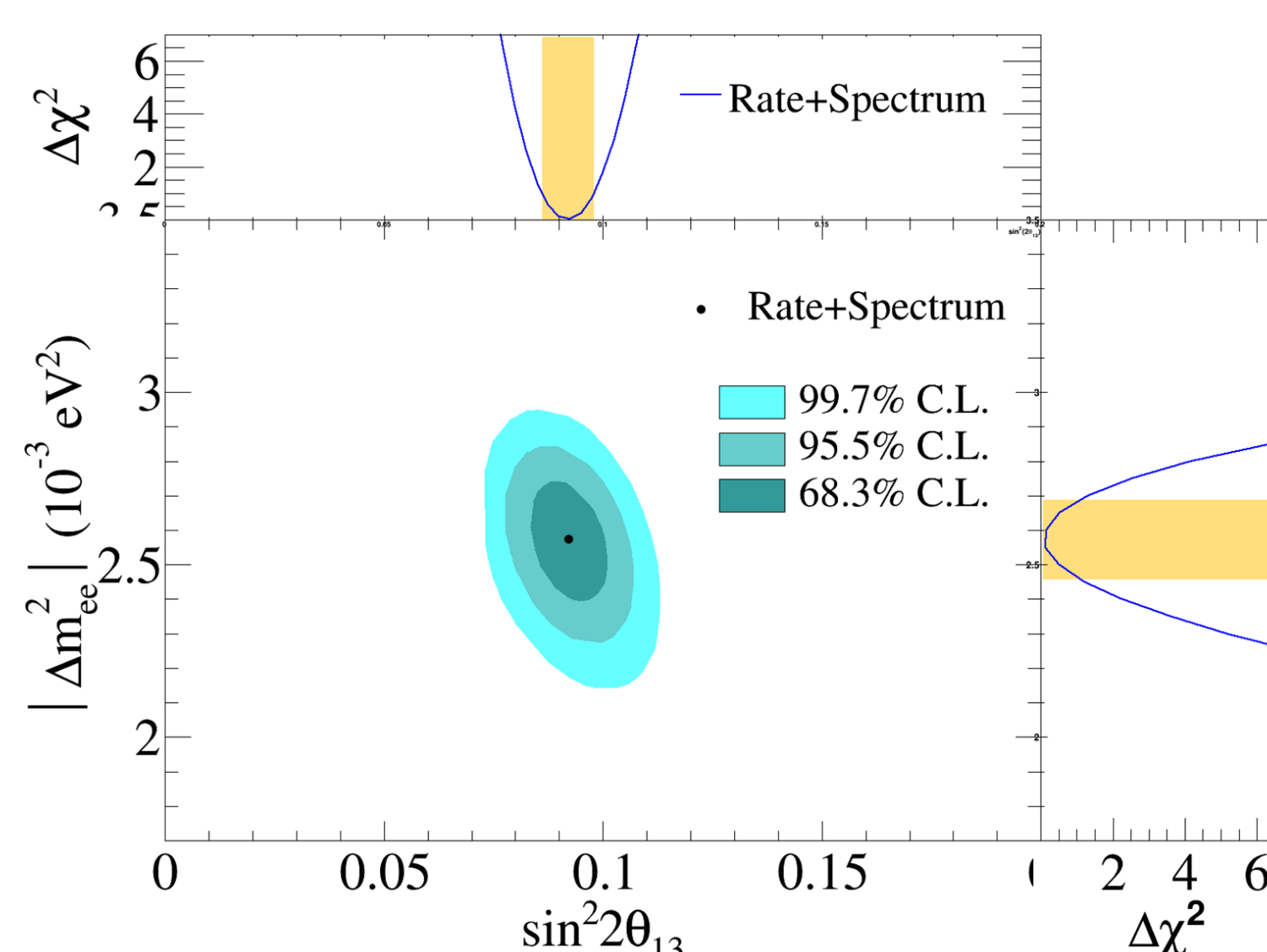
- Phys. Rev. Lett. 108, 191802 (2012) - 229[d]
- Phys. Rev. Lett. 116, 211801 (2016) - 500[d]
- Phys. Rev. D 98, 012002(2018) - 500[d]
- Phys. Rev. Lett. 121, 201801 (2018) - 2200[d]
- Phys. Rev. D 11, 112006 (2025) - 3800[d]

### Measurement of $\theta_{13}$ with nH capture

- JHEP 04 029 (2020) - 1500[d]
- 2800[d] days of data

$$\sin^2 2\theta_{13} = 0.0920^{+0.0044}_{-0.0042} (\text{stat.})^{+0.0041}_{-0.0041} (\text{syst.}) \quad (6.4\% \text{ precision})$$

$$|\Delta m^2_{ee}| = 2.57^{+0.10}_{-0.11} (\text{stat.})^{+0.05}_{-0.05} (\text{syst.}) (\times 10^{-3} \text{ eV}^2) (4.5\% \text{ precision})$$



### Reactor neutrino yield & spectrum

- Phys. Rev. Lett. 122, 232501 (2019) - 1800[d]
- Phys. Rev. D 104, L111301 (2021) - 2900[d]

### Results from sterile neutrino search

- Phys. Rev. Lett. 125, 191801 (2020) - 2200[d]
- Phys. Rev. D 105, L111101 (2022) - 2500[d] x NEOS 180[d]