Report on status of my research

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Nuclear reaction

- Nucleosynthesis (Fusion reaction in stars)
- Super heavy nuclei (Artificial fusion reaction)

Our Goal

Microscopic theory with tunneling

Advantage of our theory

- **Independet of reaction experiment** $\Leftrightarrow$ Modeling
- **Tunneling effect** $\Leftrightarrow$ Existing microscopic theory

Plan of my research

1st year of Ph.D. course

- **Construct new theory for nuclear reaction**

2nd year of Ph.D. course (here now)

- **1D collision calculation**

3rd year of Ph.D. course

- **Extend to 3D and realistic case**

Current status of my research

1D simulation of $^4\mathrm{He} + {}^4\mathrm{He}$

Some restriction (here now)

(The paper is submitted to PRL

N. H., K. Hagino, Y. Tanimura, "Time-Dependent Generator Coordinate Method for Many-Particle Tunneling")

More generally

(excitation, heavier nuclei, ...)

Plan of GPPU duty

Seminar point

GSP 17 + GASP 11

Plan of my study abroad

- **Online seminar**
  (Seminar series by Prof. Machleidt,
  Seminar series in UK http://ns.ph.liv.ac.uk/lockdownseminars)
- Exchange emails with overseas researchers