| Division of Mechanical Science and   | Research<br>field | Quantum informatiopn theory  | Lab. ID |
|--|-------------------|------------------------------|---------|
| Laboratory web site  | lield             |                              | LUHZ    |
| Research subjects  |                   |                              |         |
| Quantum information processing, which has been attracting increasing attention recently, is considered to have             |                   |                              |         |
| several advantages over conventional classical information processing. On the other hand, quantum information              |                   |                              |         |
| realized by current technology is susceptible to noise, and it is an important issue to consider the effect of noise on    |                   |                              |         |
| quantum information processing. From the viewpoint of theoretical statistics, quantum statistics can be regarded as        |                   |                              |         |
| a noncommutative extension of classical statistics, and the uncertainty principle and other principles of quantum          |                   |                              |         |
| mechanics are derived from noncommutativity. In this laboratory, we aim to understand the essence of quantum               |                   |                              |         |
| information through theory and simulation, and to understand what can be done and what cannot be done.                     |                   |                              |         |
| Master/Doctor course: Education policy, curriculum, typical activity in the laboratory                                     |                   |                              |         |
| Quantum information theory has many unsolved problems, and we will work to resolve them.                                   |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
| Daily life in the laboratory, etc.   |                   |                              |         |
| There is no master/doctor course student at this moment.   |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
| Message or comments by the laboratory faculty staffs   |                   |                              |         |
| Since this is a newly established laboratory, there is nothing here yet, but we would like to enhance it little by little. |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
| Recent Master theses in these 3 years (+ more if appropriate)  |                   |                              |         |
| year.month  Thesis title (including En   | glish translatio  | on of Japanese thesis title) |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
| Recent Doctoral theses in these 3 years (+ more if appropriate)  |                   |                              |         |
| year.month Thesis title (including English translation of Japanese thesis title)   |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
|  |                   |                              |         |
| aboratory mail address   |                   |                              |         |
|  |                   |                              |         |