

論文 / 著書情報  
Article / Book Information

題目(和文)	
Title(English)	Beam Monitor Development for the RF Cavity Tuning of High-Intensity Proton Accelerator Facility
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出典(和文)	学位:博士(工学), 学位授与機関:東京工業大学, 報告番号:甲第10208号, 授与年月日:2016年3月26日, 学位の種別:課程博士, 審査員:堀岡 一彦,堀田 栄喜,高山 健,小栗 慶之,長谷川 純
Citation(English)	Degree:, Conferring organization: Tokyo Institute of Technology, Report number:甲第10208号, Conferred date:2016/3/26, Degree Type:Course doctor, Examiner:,,,,,
学位種別(和文)	博士論文
Category(English)	Doctoral Thesis
種別(和文)	論文要旨
Type(English)	Summary

## 論文要旨

### THESIS SUMMARY

専攻： 創造エネルギー 専攻  
Department of  
学生氏名： 三浦 昭彦  
Student's Name

申請学位(専攻分野)： 博士 (工学)  
Academic Degree Requested Doctor of  
指導教員(主)： 堀岡 一彦  
Academic Advisor(main)  
指導教員(副)：  
Academic Advisor(sub)

#### 要旨(英文 800 語程度)

Thesis Summary (approx.800 English Words)

The present thesis describes a beam monitor development and tuning results using the developed beam monitors in the linac of Japan proton accelerator research complex (J-PARC).

The thesis consists of the following nine chapters.

Because the thesis mainly refers to the beam monitor development to meet with the project of output energy upgrade of J-PARC linac, the outlines of the J-PARC history and the linac upgrade project are introduced in the first chapter (Chapter 1). Also the objectives of the beam monitors developed in the project is mentioned.

After the introduction, tuning strategies are introduced to prepare the explanation of the beam commissioning using the newly developed beam monitors. Before the descriptions of each beam monitor, a beam monitor layout which is strongly contributed to the tuning strategies is introduced and the design specification are summarized in the chapter (Chapter 2).

From chapter 3 to 7, basic ideas of the design and fabrications of the beam monitors are introduced. Chapter 3 is for a beam current and phase monitor, chapter 4 is for a beam position monitor, chapter 5 is for a transverse profile monitor, chapter 6 is for a longitudinal beam profile monitor and chapter 7 is for a beam loss monitor.

Theoretical calculations and analyses are conducted for the beam monitor designs of the beam monitors to be installed in the energy upgraded beam line and some of the results are shown. For the upgrade project, we chose annular-coupling structure linac (ACS) cavities. The most important tuning after the project is the longitudinal beam profile matching at the injection point of the new ACS cavities because the acceleration frequency of ACS is thrice of the SDTL. Both the transverse and longitudinal beam profile monitors are developed and improved. New tuning strategies using these profile monitors are also introduced in these chapters. These chapters refer to the characteristic data obtained from on- and off-line tests. In the last of these chapters, the configurations of the beam monitoring system of the linac are introduced.

Newly developed beam monitors are commissioned to check the proper functioning of monitors and used for the beam dynamics studies. Finally a beam commissioning using the newly developed beam monitors and an interlock systems are discussed in Chapter 8.

The last chapter (Chapter 9) summarizes the beam monitor developments for the energy upgrade and shows the results of their beam dynamics studies together with the conclusion of thesis.

備考：論文要旨は、和文 2000 字と英文 300 語を 1 部ずつ提出するか、もしくは英文 800 語を 1 部提出してください。

Note：Thesis Summary should be submitted in either a copy of 2000 Japanese Characters and 300 Words (English) or 1copy of 800 Words (English).

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