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Development of a friendly high-energy irradiation environment for future space developments

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Effect assessments of high-energy radiations on materials and equipment are expected to become increasingly important in near future space developments. We initiated a project to construct an irradiation environment with high-energy radiations using the electron linear accelerator at Nihon University. The advantages of using this accelerator include the accelerations up to 100 MeV for high-energy and high-dose irradiations, its easy accessible location from Tokyo area. These advantages help many users including venture companies to use the irradiations with much less difficulties, that we consider as an important key to enhance future space developments.
The electron linear accelerator sends electron beams with a wide energy range to the FEL line by bending them 90 degrees with two 45-degree bending magnets. Irradiation tests are planned to be conducted using the radiation produced in this process. In this study, we present a simulation result on the acceleration process of the electron beam and the amount of radiation generated by the 45-degree bending magnets. We also show dosimeter measurements by the high-energy irradiations to be compared with the simulation results.

Footnotes

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Author: KURATA, Mizuki (Nihon University)

Co-authors: YAMATO, Sayaka (Nihon University); SAKAI, Takeshi (Nihon University); HAYAKAWA, Yasushi (Nihon University); SUMITOMO, Yoske (Nihon University)

Presenter: KURATA, Mizuki (Nihon University)

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