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## Non-Destructive Beam Spatial Profile Measurement for a High-Intensity Ion Beam Using a Gas Sheet Monitor

In a high-intensity ion beam accelerator, a non-destructive beam profile diagnostic system is required since destructive measurements can cause system failure or radio-activations of the monitor components due to energy deposition. We have been developing a non-destructive beam spatial profile monitor using a gas sheet. The sheet-shaped gas formed by a technique of rarefied gas dynamics is injected into a beam line. The sheet gas interacts with the beam and produces ions, electrons, and photons from the gas molecules. The spatial distributions of the produced particles depend on the beam profile and the sheet gas density distribution in proportion. The beam profile can be reconstructed from the produced particle distributions by considering the gas density distribution. The details of the developed profile monitor and the results of the profile measurement of 3 MeV, 60 mA negative hydrogen ion beam in J-PARC Linac by photon detection will be reported.

### E-mail for contact person

ip\_yamada@icloud.com

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**Primary authors:** YAMADA, Ippei (Doshisha Univ. / J-PARC center); KAMIYA, Junichiro (Japan Atomic Energy Agency); KINSHO, Michikazu (Japan Atomic Energy Agency); WADA, Motoi (Doshisha University)

**Presenter:** YAMADA, Ippei (Doshisha Univ. / J-PARC center)

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