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Development of a Novel Surface Ionizer for the Electron EDM Measurement using Francium

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Francium (Fr) is expected to be a powerful probe for measuring the electron electric dipole moment (eEDM) in high precision, due to its large EDM enhancement factor. We have developed a surface ionizer to produce a high-intensity Fr ion beam at RIKEN. Due to spatial constraints of the experimental area, the yielded ions must be extracted from the ion source at an angle of 45 degrees with respect to the ionizing surface. By using an electrode of novel design, an efficient extraction of the ion beam is expected based on simulations. The demonstration of Fr ion production using this developed ion source is planned this fiscal year.

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