

# PERFORMANCE OF THE RENEWED L-BAND LINAC AND RECENT PROGRESS OF DEVELOPMENT OF FEL AND SASE AT OSAKA UNIVERSITY

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## Abstract

The 40 MeV, L-band electron linac at the Institute of Scientific and Industrial Research, Osaka University is used for various studies on advanced beam sciences. The linac was constructed in 1975-1978 and largely remodeled in 2002-2004 for higher operational stability and reproducibility. We have evaluated performance of the renewed linac. The beam intensity is measured for longer than an hour at the exit of the linac operated in the transient mode for pulse radiolysis experiments in the nanosecond region. The intensity fluctuation is 0.27 %, which is one tenth of the value before remodeling. We are conducting development of an FEL and basic study of SASE in the far-infrared region with the linac. The experiment was suspended and resumed again after the remodeling. We have developed a strong focus wiggler for FEL and SASE based on the edge-focusing scheme, which can make the current density of the electron beam and hence the gain of FEL higher. The renewed linac can provide a long pulse electron beam up to 8  $\mu$ s for FEL and we are now commissioning the linac in this operation mode. We will report the performance of the renewed linac and recent development of FEL and SASE.

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