

Evaluation of wakefield mitigation for upgrading the ATF final focus beamline

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The KEK-ATF (Accelerator Test Facility) is an R&D facility for the final focus system to develop the nanometer beam technology required for the International Linear Collider. ATF is the best research environment for the study of wakefield effects on the nanometer small beam. The vertical beam size growth as a function of the bunch intensity was observed at the virtual interaction point (IP), which is mainly caused by wakefield. The evaluation results of wakefield effects show that wakefield sources installed in the high beta function section of the ATF final focus (FF) beamline, such as cavity BPM and vacuum flange, have strong effects on the small beam. We will upgrade the ATF-FF beamline to mitigate wakefield effects on the small beam. To confirm mitigation effects, internal shield parts were inserted into the vacuum flange, which is one of the strong wakefield source. The mitigation effect is evaluated based on the orbit response and IP vertical beam size. This report shows the evaluation results of the mitigation of the wakefield effects and the progress and current status of the work to upgrade the beamlines to reduce the effects of the wakefield.

Footnotes

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