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## Toward an Optimal Beam-Based Feedback Control for a Continuous-Wave Linear Accelerator

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The design of a beam-based feedback control for the superconducting electron linear accelerator ELBE is progressing through its modelling stage. By taking into account the continuous-wave mode of this accelerator with its inherent steady-state RF operation we propose a disturbance rejection control scheme that takes the process disturbance explicitly into account. In particular, we analyze the contribution of RF noise to the development of electron beam instabilities and then use this knowledge in the subsequent beam-based feedback controller design. As a result, the control objective can be reformulated in terms of the H2 mixed-sensitivity problem, thus setting the goal toward an optimal control.

Accordingly, this speed talk will briefly summarize the latest results as well as highlight the next steps.

 Primary author:
 Mr MAALBERG, Andrei (Helmholtz-Zentrum Dresden-Rossendorf)

 Co-authors:
 Prof. PETLENKOV, Eduard (Tallinn University of Technology); Dr KUNTZSCH, Michael (HZDR)

**Presenter:** Mr MAALBERG, Andrei (Helmholtz-Zentrum Dresden-Rossendorf) **Session Classification:** Beam Controls