



The CERN Accelerator School

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## Imperfections and their correction in beam lines and linacs

*Thursday 22 September 2022 17:45 (1 hour)*

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We introduce the BPM-corrector response coefficient  $R_{12}$  as the key quantity to characterise the effect of imperfections on the beam dynamics before addressing how the effect of multiple imperfections are combined. We then introduce local beam bumps as a means to adjust the beam position locally and move on to discuss orbit correction and the orbit response matrix. We place special attention to different methods, including singular value decomposition, to invert the response matrix. After covering quadrupolar errors and their detrimental effects, such as beta beating and filamentation, we learn how to measure beam sizes with quadrupole scans and with multiple wire scanners. We close this session with a discussion of how to adjust beam size parameters with so-called matching quadrupoles.”

**Presenter:** ZIEMANN, Volker (Uppsala University (SE))