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## **Model-independent determination of solenoid offsets in the Sealab Injector**

*Wednesday, 10 May 2023 16:30 (2 hours)*

Sealab (SRF Electron Accelerator LABORatory) is composed of an SRF photo gun and an SRF booster, followed by a diagnostic line and a recirculation path for ERL applications. It is the follow-up project of bERLinPro, which ran from 2010-2020 at HZB. In an SRF injector, a single solenoid is sufficient to optimally focus the beam for small emittance. The alignment of the solenoid is crucial, as it is the dominant source of trajectory distortions in the facility. Polynomial Chaos Expansion (PCE) is a technique developed for risk management and uncertainty quantification. It is well suited for application in accelerators, although not well known. In this paper, PCE is used to set up a surrogate model from calculated or measured data to determine the misalignment of the solenoid in Sealab.

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### **Footnotes**

Topic submitted to PRAB

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