

A deep-learning code of beam orbit correction on ciads surperconducting linac

The MEBT of CIADS injector II has been under operation for several years successfully. It is made up of 7 quadrupoles, and there are 7 sets of adjoint Horizontal-Vertical correctors to correct the beam orbit. Five BPMs are used to obtain the beam horizontal and vertical positions, and the first one is located in front of MEBT. The beam position correction was mainly realized manually before, and the conventional method of response matrix was tested lately. This presentation focuses on the beam orbit correction test processing by deep learning. The beam positions were recorded while the correctors' current changed. Finally 17k items of events were acquired, 16k of which were used as training set, and 1k as test set. Neural networks, including back-propagation (BP) neural networks, convolutional neural networks (CNNs) and recurrent neural networks (RNNs), were set up to attempt at establishing the relationship between the current and the positions.

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