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## A vibration control method for linear accelerator

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The beam orbit or effective emittance is correlated with the mechanical vibrations of quadrupole magnets. To mitigate the impact of vibrations on beam orbit stability, active vibration isolation platforms can be employed to enhance the stability of magnets and other components. This paper presents an active vibration isolation system based on the inverse piezoelectric effect, combined with a feedforward control algorithm to improve the positional stability of the magnets. This vibration isolation system has been deployed in batches in the SHINE project. Test results demonstrate that the active vibration isolation system achieves over 50% displacement attenuation, facilitating beam tuning and indicating that this control strategy holds significant potential for broader application in linear accelerator construction.

### Footnotes

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