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Cavity compensation studies in the JAEA-ADS superconducting linac using LightWin

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High-intensity accelerators, particularly Accelerator-Driven Systems (ADS), require high availability and reliability for proper operation. For superconducting linear accelerators, the ability to continue operating even when one of the RF cavities fails is key to achieving the required availability, known as cavity compensation. Beam dynamics studies of the JAEA-ADS linear accelerator have demonstrated the possibility of operating with multiple RF cavities disabled with acceptable beam quality. Several other superconducting linear accelerator laboratories have adopted similar methods and developed their procedures. Among these efforts, the LightWin tool has proven to be an effective tool for automatically and systematically identifying compensation settings for each cavity failure in any linear accelerator. This software has been successfully utilized on the MINERVA linac, as well as on the high-energy part of the JAEA-ADS linac. It has currently been tested and improved to ease SPIRAL2 operation. This work presents an analysis of cavity compensation in the JAEA-ADS superconducting linear accelerator using the LightWin tool and compares the results with previous studies.

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Footnotes

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