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Shielding Studies for Superconducting RF Cavities at Fermilab

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Test facilities for high-gradient superconducting RF cavities usually are strong sources of radiation due to field emitted electrons inside the cavities. Design of shielding for such facilities involves significant uncertainties because of lack of a reliable model of the field emission. Present work describes a semi-empirical method that allows us to predict the intensity of the generated field emission. Spatial, angular and energy distributions of the generated radiation are calculated with the Fishpact code. The Monte Carlo code MARS15 is used for modeling the radiation transport in matter. Comparisons with measurements performed in the Fermilab Vertical Test Facility for ILC-type cavities with accelerating gradients up to 35 MV/m are presented as well.

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