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FEA simulations for the reuse of front-end components for PETRA IV

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The DESY upgrade project PETRA IV includes a major change of design parameters for all components in the ring as well as in the beamlines. Especially the white beam high heat load components currently in use in PETRA III have to be evaluated for their reusability. A case study of a front-end power slit is presented in this paper to show the necessary steps. From given ring and undulator parameters the heat load profiles are calculated. They are imported into ANSYS Workbench using a method to apply heat flux even on freeform surfaces. The FEA model then allows to evaluate cooling water parameters as well as temperatures, deformations and von Mises stresses for all components.

Footnotes

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