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## ITR/P1-25: 3D Vacuum Magnetic Field Modeling of the ITER ELM Control Coils during Standard Operating Scenarios

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ITER edge localized mode (ELM) coil current optimization and failure studies have been completed for nine standard operating scenarios using an automated program that calculates the vacuum island overlap width (VIOW) and compares the results to a criterion that has been correlated with ELM suppression in DIII-D. The analysis was done, using  $n=3$  and 4 perturbation fields, by varying the spatial phase of a cosine waveform approximated by the currents in the 9 coils making up each of the three rows of ELM coils. Results from the cases studied show that the minimum ELM coil current needed to satisfy the DIII-D correlation criterion varies from 20 kAt to 50 kAt depending on the operating scenario and that the available phase angle operating space increases rapidly with coil current above the minimum. It is also found that the DIII-D correlation criterion can be satisfied in the most demanding ITER scenario with  $n=3$  perturbation fields and with failures in up to 8 of the full 27 coil set although the available phase angle operating space is reduced from 79% with no failures to 27% with eight failures using a maximum ELM coil operating current of 90 kAt. Details of these results will be discussed along with plans to extend the analysis to include the plasma response to the perturbation field.

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