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Tue-Mo-Po2.05-01 [24]: Analytical formulation of mechanical stresses in no-impregnated, multi-layer solenoids

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This paper develops and summarizes analytical formulations of radial and tangential stresses of superconducting, no-impregnated solenoids, based on a multilayer model. The analysis takes into account the fabrication steps (pre-winding and reinforcement), cooling-down and energization of the coil (magnetic loading). Both isotropic and orthotropic cases are considered.

Representative calculations for metal-as-insulation coils are presented and benchmarked against FEM computations with the CAST3M code.

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