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Linear approximation of volume integral equations for solving magnetostatics problems

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Volume integral equations method is considered for calculation of magnetic systems. We discuss an approach, based on finite element linear approximation of unknown vector field variables. Initially a three-dimensional domain is represented as a combination of standard macro-blocks with two-dimensional mesh on the boundaries. This allows to generate three-dimensional mesh in each individual block. Cubature formula methods are used for matrix coefficient calculations. We introduce a special procedure for evaluating matrix elements in a singular case. The results of various magnet systems simulations based on this approach are shown.

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