CHARACTERIZATION OF CURL-FREE FIELDS WITH CURL-CONFORM FINITE ELEMENTS FOR MAGNETODYNAMIC FORMULATIONS – CONSTRUCTION OF A REDUCED FORM

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Abstract. A technique is developed to characterize curl-free fields to be used as source fields or global basis functions of inductors in magnetodynamic finite element formulations. A reduced characterization of such fields using curl-conform finite elements is defined and is shown to be convenient for both the coupling with complementary reactions fields and the explicit definition of global quantities. The reduced form rests on the choice of supports for the fields limited to transition layers associated with cuts making the definition domain simply connected. An automatic construction of these curl-free spaces is proposed. Computational results are presented.