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A NUMERICAL METHOD FOR AN ELECTROMAGNETIC FORMING PROBLEM IN AXISYMMETRIC DOMAINS

Alfredo Bermúdez[a], Carlos Reales[b,c], Rodolfo Rodríguez[b] and Pilar Salgado[a]

[a]*Departamento de Matemática Aplicada, Universidade de Santiago de Compostela, 15706, Santiago de Compostela, Spain, http://www.usc.es/dmafm*

[b]*Departamento de Ingeniería Matemática, Universidad de Concepción, Casilla 160-C, Concepción, Chile, http://www.ing-mat.udec.cl*

[c]*Departamento de Matemática y Estadística, Universidad de Córdoba, Montería, Colombia, http://www.unicordoba.edu.co*

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Abstract. Electromagnetic forming (EMF) is a dynamic, high strain-rate forming method. In this process, deformation of the work piece is driven by the interaction of a current induced in the same work piece by a magnetic field generated by an adjacent coil. The aim of this work is to study a simplified electromagnetic model governing the phenomena in axisymmetric domains. We present a time-dependent variational problem for this and establish well-posedness. To solve the weak problem, we develop a computational code that uses finite elements for the space variable and implicit time-discretization. Moreover, *a priori* error estimates for the semi-discretized problem are proved. Finally, some numerical experiments which allow assessing the performance of the method are reported.