Dead Zone Capture in Direct Extrusion of Aluminum by Finite Volume Method

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ABSTRACT

Nowadays, finite element method is still the first choice of researchers in their metal forming analysis [2,4]. However, literature suggests that metal plastic flow can be analysed by the flow formulation [2,4]. Thus, metal flow can be modelled such as an incompressible viscous fluid [2]. Recently, there is a trend to use finite volume method in metal forming analysis [1]. In this work the numerical scheme presented in [5], based in finite volume method using the explicit MacCormack method analyse metal direct extrusion with an structured and collocated mesh based on the SIMPLE Method to attain pressure-velocity coupling [1,3,5]. The main aim of the scheme is to obtain the distribution of axial and radial velocity and pressure. From these results, it was possible to get and to identify the dead zone inside the billet in a direct extrusion of aluminium with a die 90° work zone [2,4]. The field variables results presented in this work had good agreement when compared with literature [1].

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