

Finite elements and the method of characteristics applied to water hammer modelling

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SUMMARY

The paper deals with the problems related to water hammer modelling in hydraulic networks. Although the existing models, based on the finite element method and weak formulations of the problems, have certain advantages, they also have certain drawbacks, particularly when dealing with real hydraulic systems. Herein, attention is paid to the method of characteristic. However, since this method implies a complex approach it has not been widely applied in practice. Even when it was successfully applied, certain constraints related to the relative value of the time step compared to the space step, made it expensive. The new approach proposed in this paper is based on the finite element method. The main problem consists in determining the finite element matrix and vector according to the method of characteristics.
