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ISSUES OF HYPERBOLIC HEAT EXCHANGE EQUATION IN POLAR CO-ORDINATE SYSTEM[1]

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Intensive quenching method in water is patented several decades ago [1; 2]. Classical heat exchange equation [3; 4] is used to describe the process. To describe quenching process by hyperbolic heat exchange equation in paper [5] by prof. A.Buiķis is offered.

Intensive quenching technical processes as well as mathematical models meet with several difficulties caused by a number of reasons. Firstly, if cooling process of part exceeds some critical heat flow value thin layer of water steam can form on the surface of part and so called film boiling can begin. During film boiling process part can be frequently fractured. Then nucleate boiling process caused by fractures begins, id est., non linear boundary conditions required for process mathematical describing. Secondly, there are no exact mathematical verified solutions for parts with more complicated geometry. Usually Kondratjev number (form factor) used to reduce complex problem to problem with simpler domain. Thirdly, solution of hyperbolical heat exchange equation requires additional initial conditions (heat flux), which is unknown from praxis; therefore issue is reduced to inverse non stationary problem.

All these issues are discussed in this talk.

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