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Computational Model of Selected Transport Processes in an Infant Incubator

Maciej K. Ginalski, Andrzej J. Nowak

ITC SUT Gliwice, Poland

The major objective of this study was to investigate transport processes of heat and mass flow within an infant incubator, were the premature newborn baby is nursed, using the modern numerical techniques. Up to now, analysis, considering those subjects, has been made only through experimental methods with a large factor of results generalization. In those days it is possible to examine that kind of problems with high accuracy by using Computational Fluid Dynamics which were successfully used in many different domains. In order to create an appropriate numerical model a three-dimensional model of the incubator itself and a newborn child were created in CAD application and examined with a commercial CFD package called Fluent. This experiment includes calculations of the coupled heat transfer due to heat conduction, convection, thermal radiation and evaporation and mass transfer inside of the incubator. Obtained results of calculations were numerically verified as well as compared with results published in the subject literature.

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