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Technical Comments

Comment on "Cool-Down of a Vertical Line with Liquid Nitrogen"

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MODELING of two-phase flow is one of the difficult problems in engineering. I appreciate the efforts of the authors in trying to provide us with a robust model.[1] However, a look at the calculated results presented in Figs. 6 and 8 seems to suggest the violation of simple principles. For given conditions of the problem in the article, crossover of temperature-time plots in the figures suggests anomalous behavior. These figures indicate that downstream locations cool more than upstream locations, inconsistent with simple principles of heat transfer for the conditions of the problem. The authors did not offer any explanation for this behavior. It would be in the interest of the scientific community if the authors throw some light on this behavior.

Reference

[1]Hedayatpour, A., Antar, B. A., and Kawaji, M., "Cool-Down of a Vertical Line with Liquid Nitrogen," *Journal of Thermophysics and Heat Transfer*, Vol. 7, No. 3, 1993, pp. 426–434.

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THE model, as described in the paper, provided good results for the low flow rates (Fig. 10); however, for the high flow rates, the model provided contradictory results as mentioned so rightfully by Dr. Ravikumar. One may argue that at higher flow rates, due to increasing vapor velocity in the downstream, the heat transfer increases, which provides the results shown in Figs. 6 and 8.

Therefore, it is necessary to emphasize that the described model could be valid for the low flow rates, and the model is not recommended for high flow rate cases. The authors would like to express their thanks to Dr. Ravikumar for his comments.

Reference

[1]Hedayatpour, A., Antar, B. A., and Kawaji, M., "Cool-Down of a Vertical Line with Liquid Nitrogen," *Journal of Thermophysics and Heat Transfer*, Vol. 7, No. 3, 1993, pp. 426–434.

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